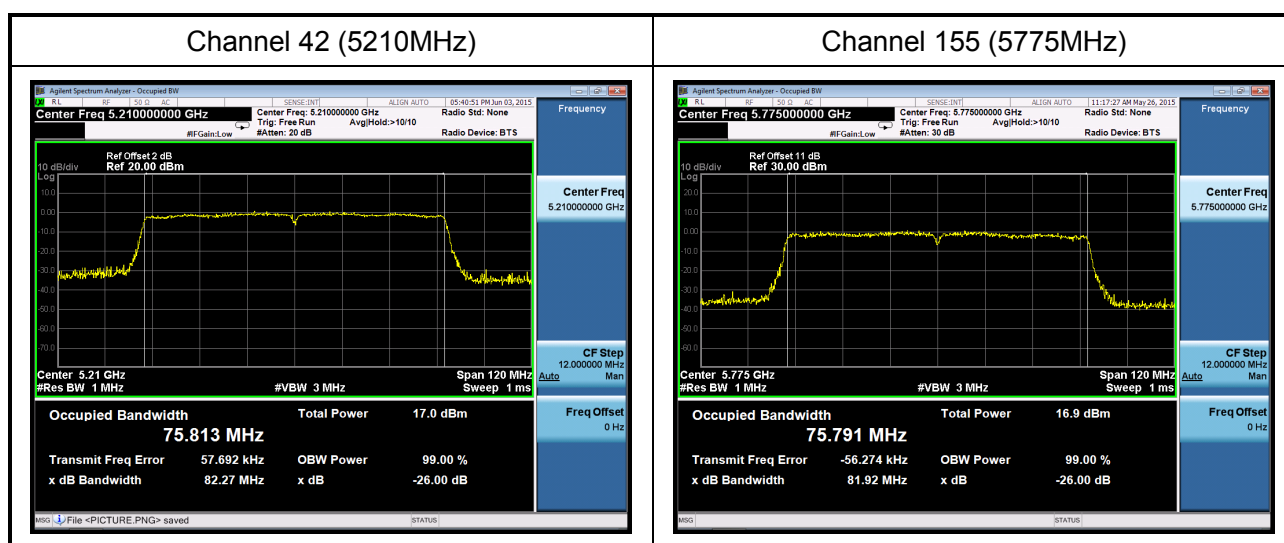




|           |                                   |
|-----------|-----------------------------------|
| Test Item | Occupied Bandwidth                |
| Test Mode | Transmit by 802.11ac(80MHz) Ant 1 |
| Test Date | 2015-06-03                        |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | 99% Occupied Bandwidth (kHz) | Result |
|-------------|-----------------|-------------------------|------------------------------|--------|
| 42          | 5210            | 82.27                   | 75813                        | Pass   |
| 155         | 5775            | 81.92                   | 75791                        | Pass   |





## 7. 6dB Bandwidth Measurement

### 7.1 Test Equipment

| Instrument                  | Manufacturer | Type No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|----------|------------|------------------|-------------|
| Spectrum Analyzer           | Agilent      | N9010A   | MY53400169 | 2014.11.03       | 2015.11.03  |
| Temperature/ Humidity Meter | Zhicheng     | ZC1-11   | CEP-TH-003 | 2015.03.31       | 2016.03.30  |

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 7.2 Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

### 7.3 Test Procedure used

KDB 789033 D02v01 – Section C.2

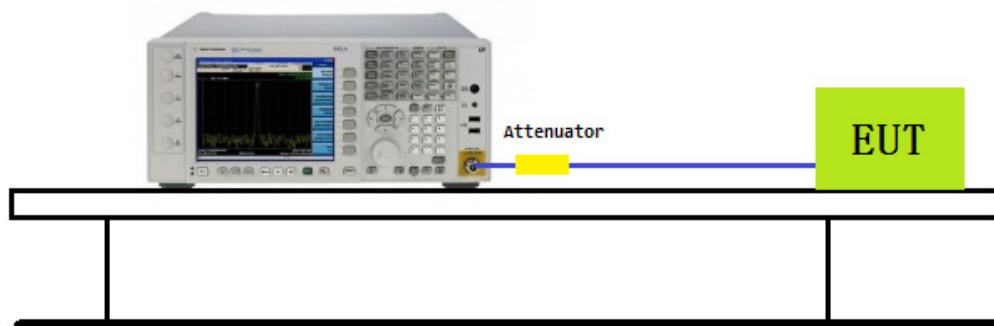
### 7.4 Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.



## 7.5 Test Setup

### Spectrum Analyzer



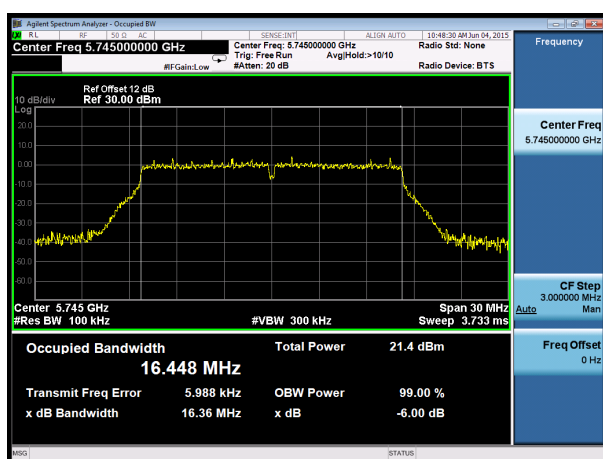


## 7.6 Test Result

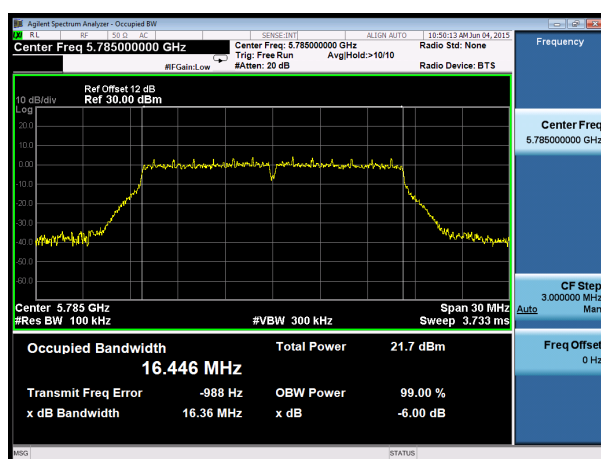
|           |                           |
|-----------|---------------------------|
| Test Item | 6dB Bandwidth Measurement |
| Test Mode | Transmit by 802.11a Ant 0 |
| Test Date | 2015-06-04                |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 16.36                   | Pass   |
| 157         | 5785            | 16.36                   | Pass   |
| 165         | 5825            | 16.45                   | Pass   |

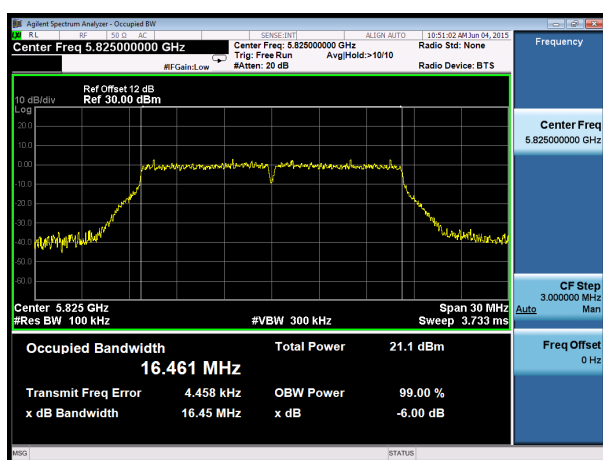
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

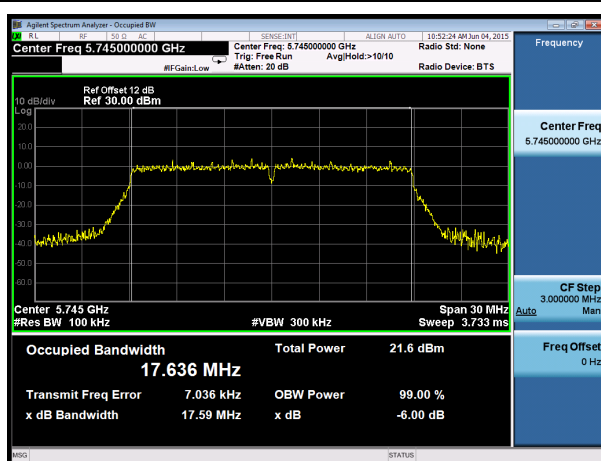




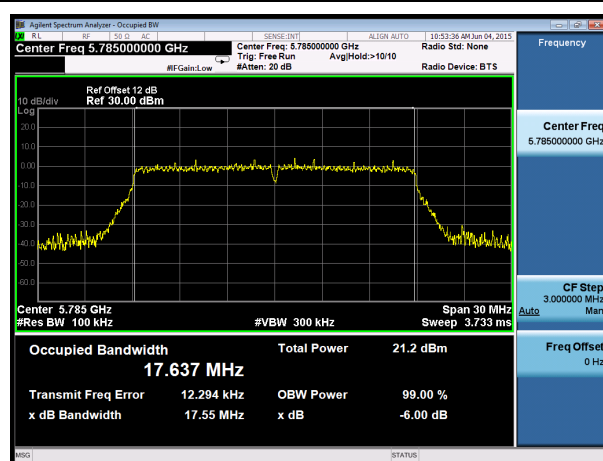
|           |                                  |
|-----------|----------------------------------|
| Test Item | 6dB Bandwidth Measurement        |
| Test Mode | Transmit by 802.11n(20MHz) Ant 0 |
| Test Date | 2015-06-04                       |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 17.59                   | Pass   |
| 157         | 5785            | 17.55                   | Pass   |
| 165         | 5825            | 17.56                   | Pass   |

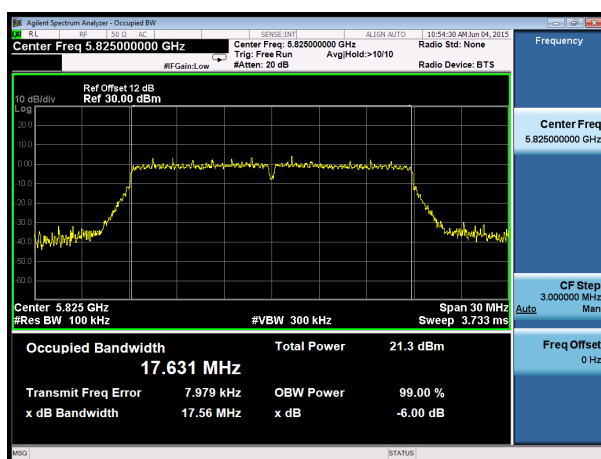
Channel 149 (5745MHz)



Channel 157 (5785MHz)



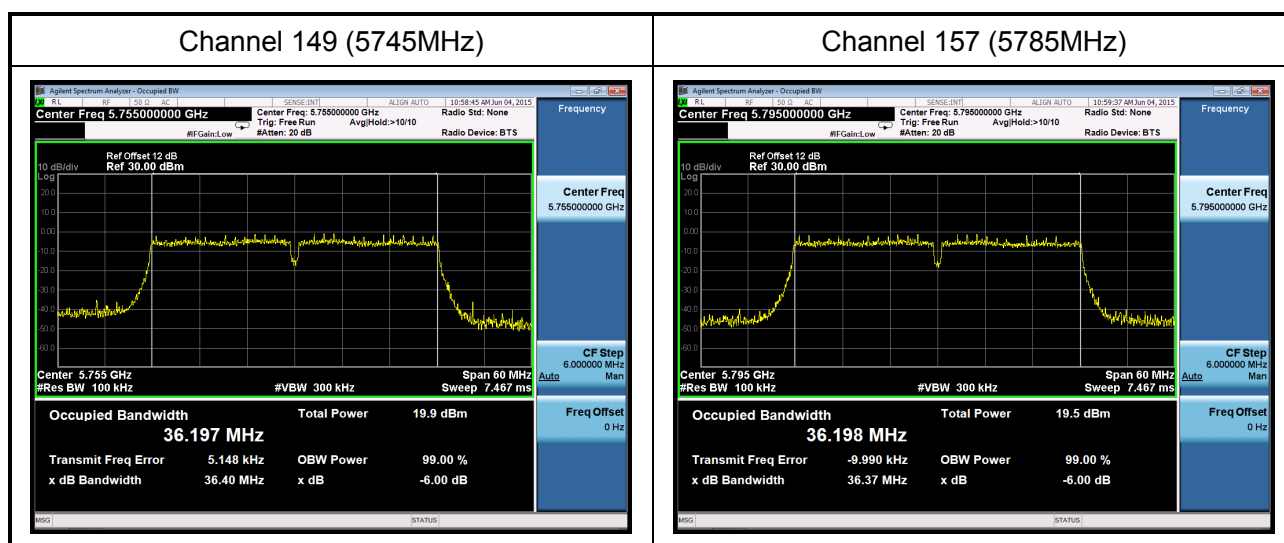
Channel 165 (5825MHz)





|           |                                  |
|-----------|----------------------------------|
| Test Item | 6dB Bandwidth Measurement        |
| Test Mode | Transmit by 802.11n(40MHz) Ant 0 |
| Test Date | 2015-06-04                       |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 36.40                   | Pass   |
| 157         | 5785            | 36.37                   | Pass   |

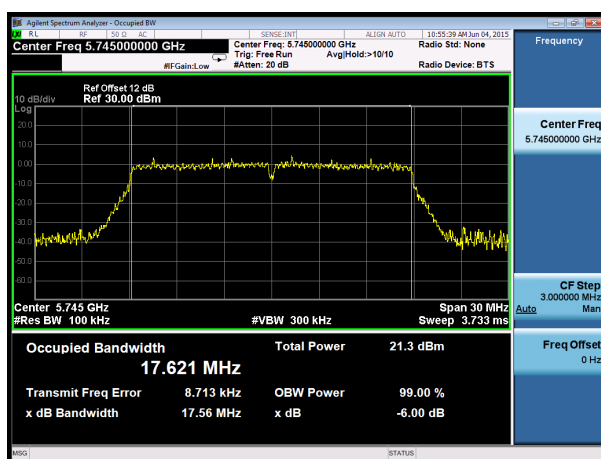




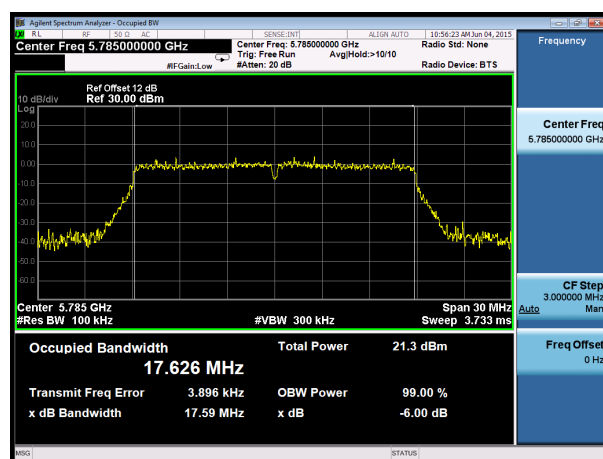
|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(20MHz) Ant 0 |
| Test Date | 2015-06-04                        |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 17.56                   | Pass   |
| 157         | 5785            | 17.59                   | Pass   |
| 165         | 5825            | 17.53                   | Pass   |

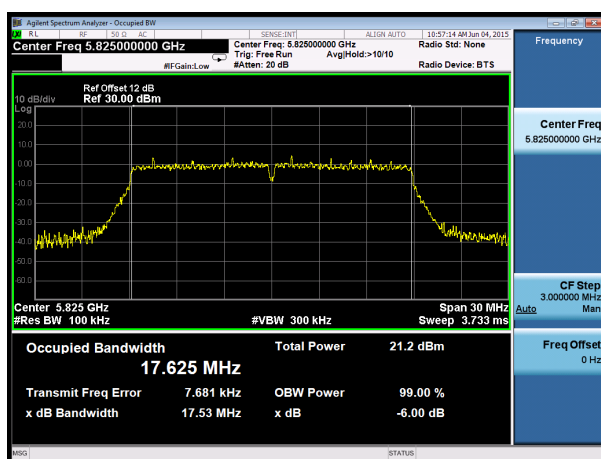
Channel 149 (5745MHz)



Channel 157 (5785MHz)



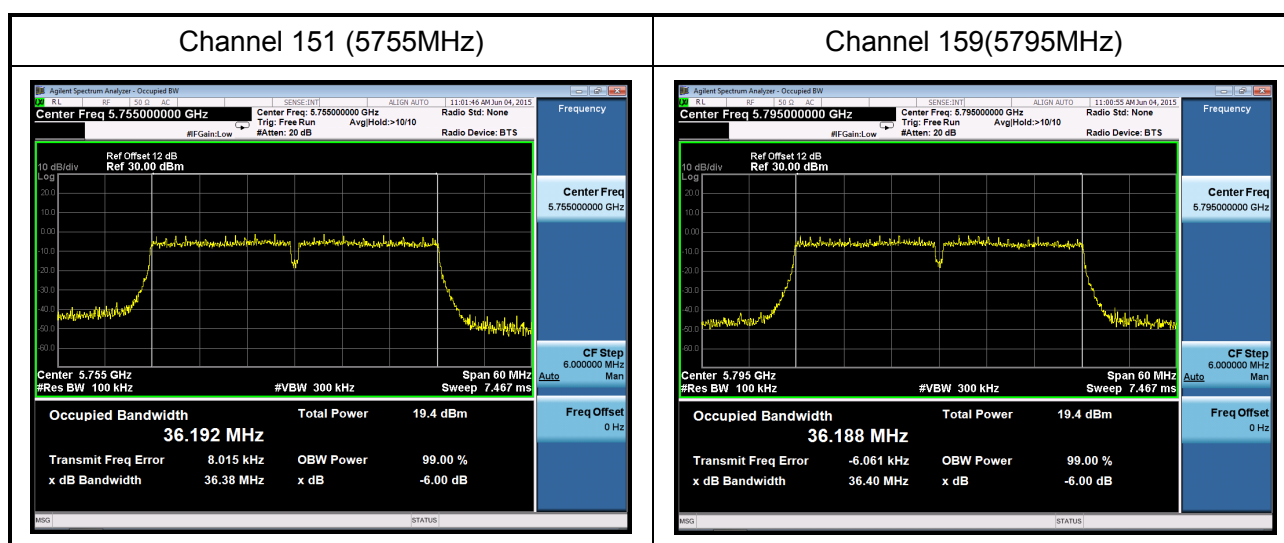
Channel 165 (5825MHz)





|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(40MHz) Ant 0 |
| Test Date | 2015-06-04                        |

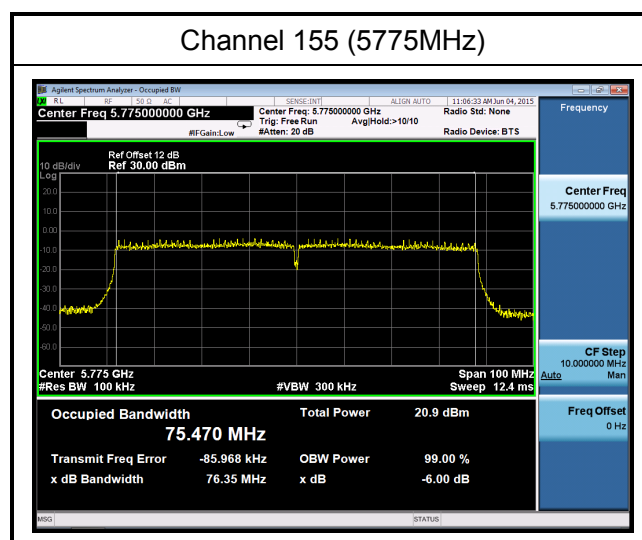
| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 151         | 5755            | 36.38                   | Pass   |
| 159         | 5795            | 36.40                   | Pass   |





|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(80MHz) Ant 0 |
| Test Date | 2015-06-04                        |

| Channel No. | Frequency<br>(MHz) | Measurement Level<br>(MHz) | Result |
|-------------|--------------------|----------------------------|--------|
| 155         | 5775               | 76.35                      | Pass   |

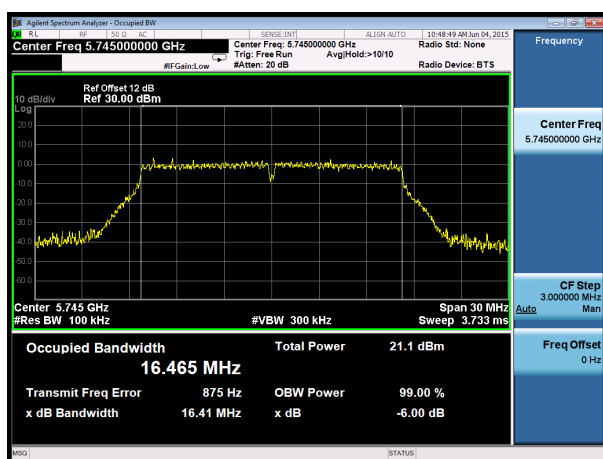




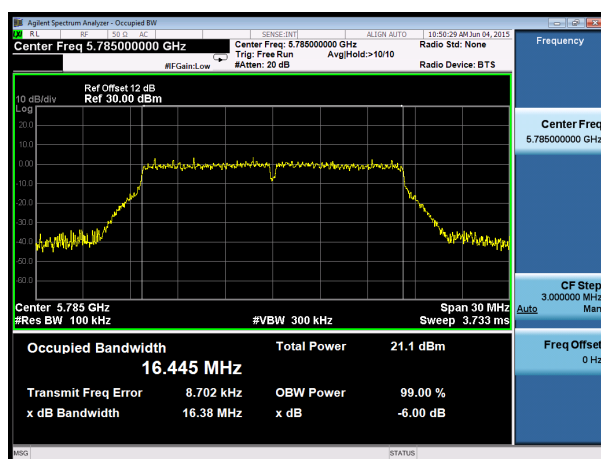
|           |                           |
|-----------|---------------------------|
| Test Item | 6dB Bandwidth Measurement |
| Test Mode | Transmit by 802.11a Ant 1 |
| Test Date | 2015-06-04                |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 16.41                   | Pass   |
| 157         | 5785            | 16.38                   | Pass   |
| 165         | 5825            | 16.35                   | Pass   |

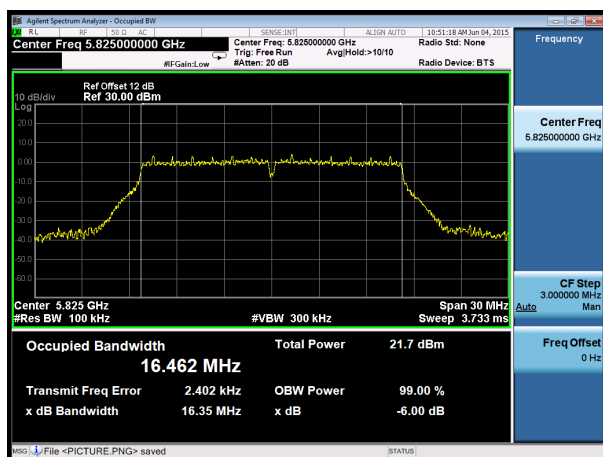
Channel 149 (5745MHz)



Channel 157 (5785MHz)



Channel 165 (5825MHz)

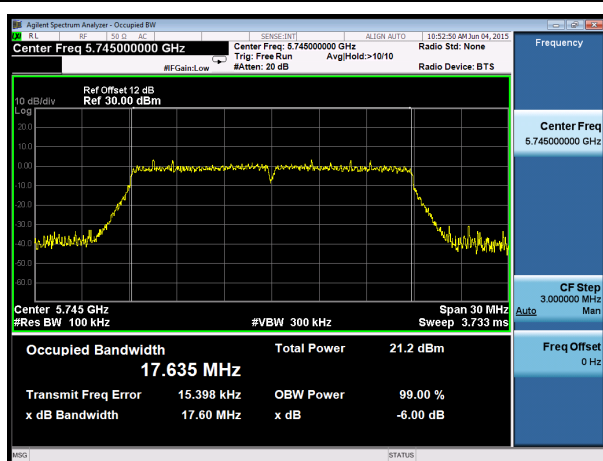




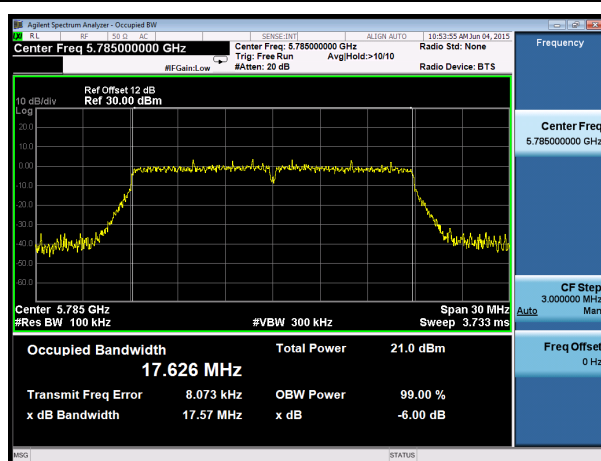
|           |                                  |
|-----------|----------------------------------|
| Test Item | 6dB Bandwidth Measurement        |
| Test Mode | Transmit by 802.11n(20MHz) Ant 1 |
| Test Date | 2015-06-04                       |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 17.60                   | Pass   |
| 157         | 5785            | 17.57                   | Pass   |
| 165         | 5825            | 17.55                   | Pass   |

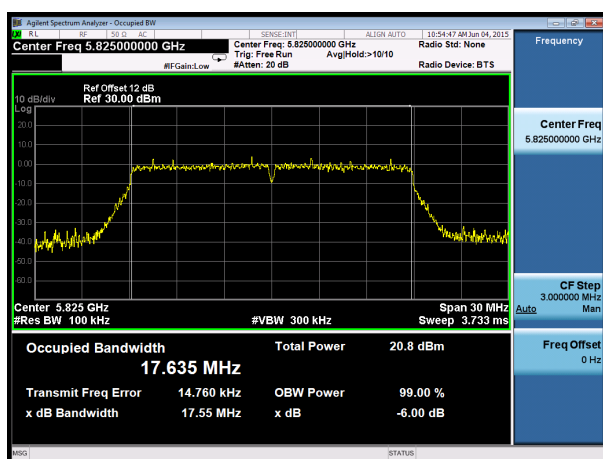
Channel 149 (5745MHz)



Channel 157 (5785MHz)



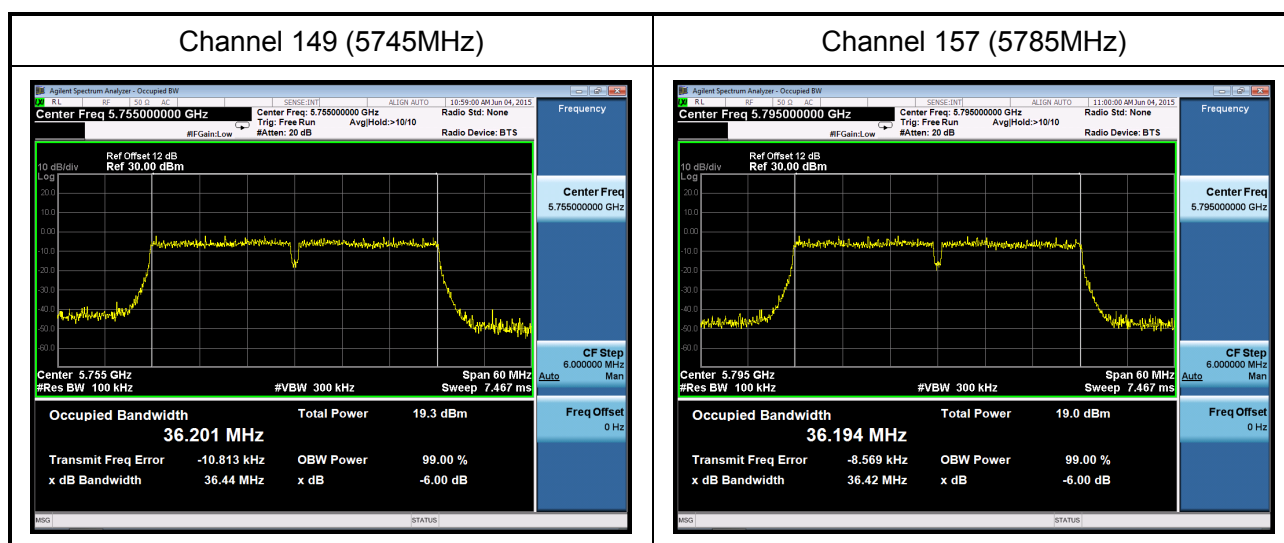
Channel 165 (5825MHz)





|           |                                 |
|-----------|---------------------------------|
| Test Item | 6dB Bandwidth Measurement       |
| Test Mode | Transmit by 802.11(40MHz) Ant 1 |
| Test Date | 2015-06-24                      |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 36.44                   | Pass   |
| 157         | 5785            | 36.42                   | Pass   |

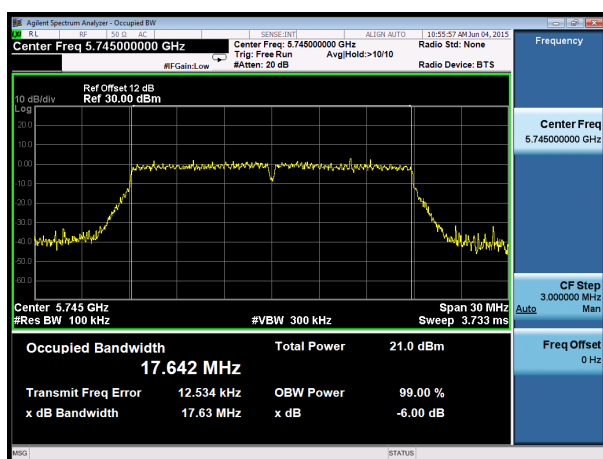




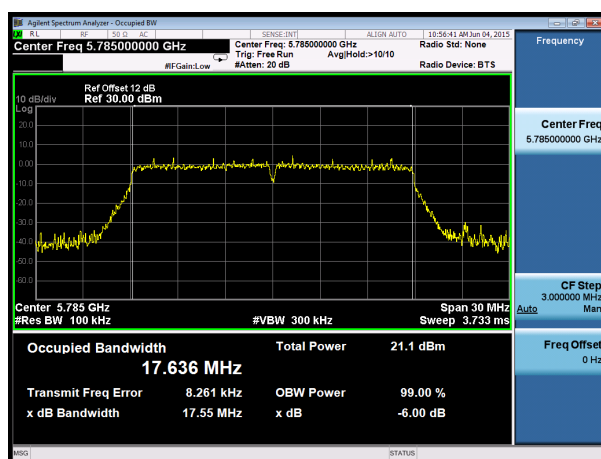
|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(20MHz) Ant 1 |
| Test Date | 2015-06-04                        |

| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 149         | 5745            | 17.63                   | Pass   |
| 157         | 5785            | 17.55                   | Pass   |
| 165         | 5825            | 17.53                   | Pass   |

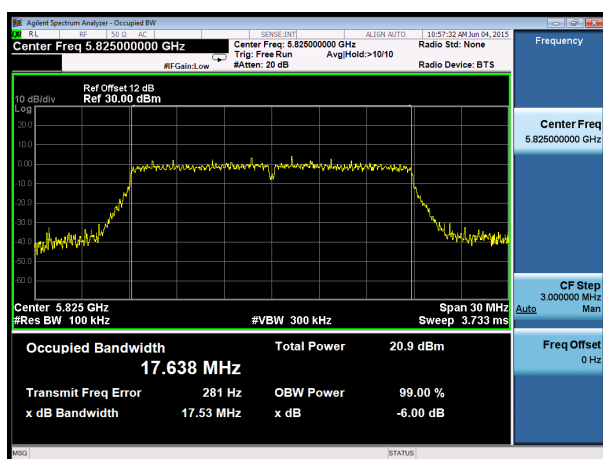
Channel 149 (5745MHz)



Channel 157 (5785MHz)



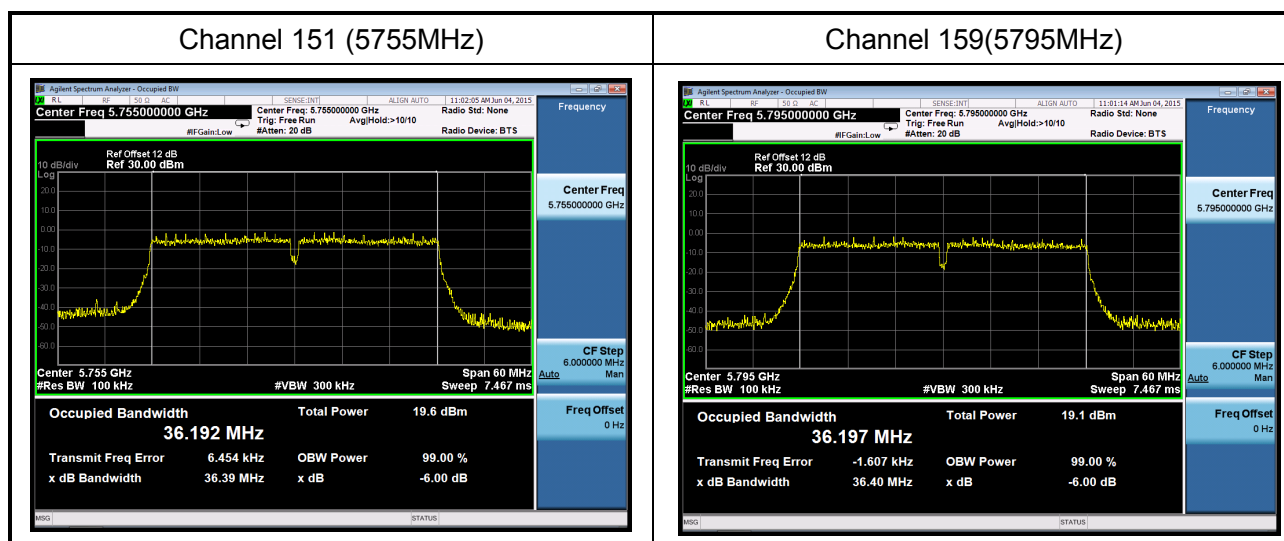
Channel 165 (5825MHz)





|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(40MHz) Ant 1 |
| Test Date | 2015-06-04                        |

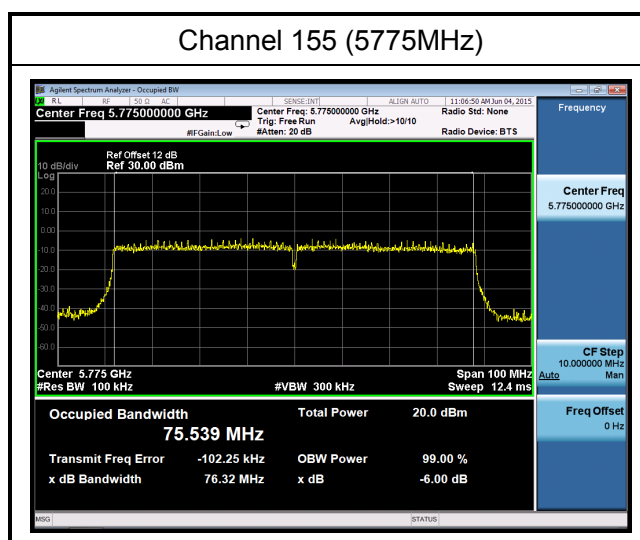
| Channel No. | Frequency (MHz) | Measurement Level (MHz) | Result |
|-------------|-----------------|-------------------------|--------|
| 151         | 5755            | 36.39                   | Pass   |
| 159         | 5795            | 36.40                   | Pass   |





|           |                                   |
|-----------|-----------------------------------|
| Test Item | 6dB Bandwidth Measurement         |
| Test Mode | Transmit by 802.11ac(80MHz) Ant 1 |
| Test Date | 2015-06-04                        |

| Channel No. | Frequency<br>(MHz) | Measurement Level<br>(MHz) | Result |
|-------------|--------------------|----------------------------|--------|
| 155         | 5775               | 76.32                      | Pass   |





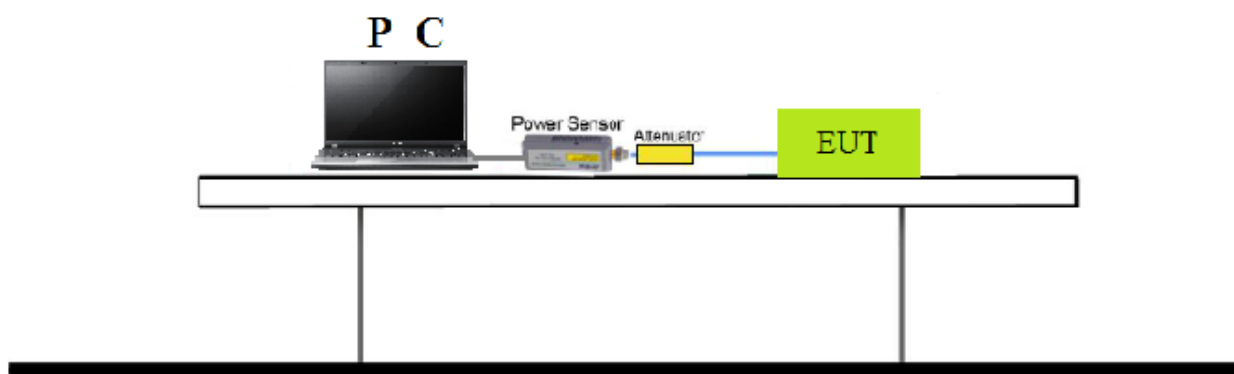
## 8. Power Output

### 8.1 Test Equipment

| Instrument                  | Manufacturer | Type No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|----------|------------|------------------|-------------|
| PC                          | Lenovo       | E40-70   | MP078UQV   | N/A              | N/A         |
| POWER SENSOR                | Agilent      | U2021XA  | MY53260020 | 2015/03/27       | 2016/03/26  |
| Temperature/ Humidity Meter | Zhicheng     | ZC1-11   | CEP-TH-003 | 2015.03.31       | 2016.03.30  |

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 8.2 Test Setup





### 8.3 Limit

- For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).
- For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
- For the band 5.725-5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antenna with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power for each 1 dB of antenna gain in excess of 23 dBi would be required.

$$5.15-5.25 \text{ GHz: Limit (dBm)} = 30\text{dBm} - (7.01\text{dBi} - 6\text{dBi}) = 28.99\text{dBi};$$

$$5.725-5.85 \text{ GHz Limit (dBm)} = 30\text{dBm} - (7.01\text{dBi} - 6\text{dBi}) = 28.99\text{dBi}.$$

### 8.4 Test Procedure

The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements. Use the wideband power meter to test RMS power and record the result.



## 8.5 Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (yellow marker) for final test of each channel.

| MCS Index for 802.11n | Spatial Streams | Data Rate (Mbps) |                 |          |                 |          |
|-----------------------|-----------------|------------------|-----------------|----------|-----------------|----------|
|                       |                 | 802.11a          | 20MHz Bandwidth |          | 40MHz Bandwidth |          |
|                       |                 |                  | 800ns GI        | 400ns GI | 800ns GI        | 400ns GI |
| 0                     | 1               | 6                | 6.5             | 7.2      | 13.5            | 15.0     |
| 1                     | 1               | 9                | 13.0            | 14.4     | 27.0            | 30.0     |
| 2                     | 1               | 12               | 19.5            | 21.7     | 40.5            | 45.0     |
| 3                     | 1               | 18               | 26.0            | 28.9     | 54.0            | 60.0     |
| 4                     | 1               | 24               | 39.0            | 43.3     | 81.0            | 90.0     |
| 5                     | 1               | 36               | 52.0            | 57.8     | 108.0           | 120.0    |
| 6                     | 1               | 48               | 58.5            | 65.0     | 121.5           | 135.0    |
| 7                     | 1               | 54               | 65.0            | 72.2     | 135.0           | 150.0    |
| 8                     | 2               | ---              | 13.0            | 14.4     | 27.0            | 30.0     |
| 9                     | 2               | ---              | 26.0            | 28.9     | 54.0            | 60.0     |
| 10                    | 2               | ---              | 39.0            | 43.3     | 81.0            | 90.0     |
| 11                    | 2               | ---              | 52.0            | 57.8     | 108.0           | 120.0    |
| 12                    | 2               | ---              | 78.0            | 86.7     | 162.0           | 180.0    |
| 13                    | 2               | ---              | 104.0           | 115.6    | 216.0           | 240.0    |
| 14                    | 2               | ---              | 117.0           | 130.0    | 243.0           | 270.0    |
| 15                    | 2               | ---              | 130.0           | 144.0    | 270.0           | 300.0    |



| Spatial Streams | MCS Index | Modulation type | Coding rate | Data Rate(Mb/s) |       |                |       |                |       |                |        |
|-----------------|-----------|-----------------|-------------|-----------------|-------|----------------|-------|----------------|-------|----------------|--------|
|                 |           |                 |             | 20MHz           |       | 40MHz          |       | 80MHz          |       | 160MHz         |        |
|                 |           |                 |             | Guard Interval  |       | Guard Interval |       | Guard Interval |       | Guard Interval |        |
|                 |           |                 |             | 800ns           | 400ns | 800ns          | 400ns | 800ns          | 400ns | 800ns          | 400ns  |
| 1               | 0         | BPSK            | 1/2         | 6.5             | 7.2   | 13.5           | 15    | 29.3           | 32.5  | 58.5           | 65     |
|                 | 1         | QPSK            | 1/2         | 13              | 14.4  | 27             | 30    | 58.5           | 65    | 117            | 130    |
|                 | 2         | QPSK            | 3/4         | 19.5            | 21.7  | 40.5           | 45    | 87.8           | 97.5  | 175.5          | 195    |
|                 | 3         | 16-QAM          | 1/2         | 26              | 28.9  | 54             | 60    | 117            | 130   | 234            | 260    |
|                 | 4         | 16-QAM          | 3/4         | 39              | 43.3  | 81             | 90    | 175.5          | 195   | 351            | 390    |
|                 | 5         | 64-QAM          | 2/3         | 52              | 57.8  | 108            | 120   | 234            | 260   | 468            | 520    |
|                 | 6         | 64-QAM          | 3/4         | 58.5            | 65    | 121.5          | 135   | 263.3          | 292.5 | 526.5          | 585    |
|                 | 7         | 64-QAM          | 5/6         | 65              | 72.2  | 135            | 150   | 292.5          | 325   | 585            | 650    |
|                 | 8         | 256-QAM         | 3/4         | 78              | 86.7  | 162            | 180   | 351            | 390   | 702            | 780    |
|                 | 9         | 256-QAM         | 5/6         | N/A             | N/A   | 180            | 200   | 390            | 433.3 | 780            | 866.7  |
| 2               | 0         | BPSK            | 1/2         | 13              | 14.4  | 27             | 30    | 58.6           | 65    | 117            | 130    |
|                 | 1         | QPSK            | 1/2         | 26              | 28.8  | 54             | 60    | 117            | 130   | 234            | 260    |
|                 | 2         | QPSK            | 3/4         | 39              | 43.4  | 81             | 90    | 175.6          | 195   | 351            | 390    |
|                 | 3         | 16-QAM          | 1/2         | 52              | 57.8  | 108            | 120   | 234            | 260   | 468            | 520    |
|                 | 4         | 16-QAM          | 3/4         | 78              | 86.6  | 162            | 180   | 351            | 390   | 702            | 780    |
|                 | 5         | 64-QAM          | 2/3         | 104             | 115.6 | 216            | 240   | 468            | 520   | 936            | 1040   |
|                 | 6         | 64-QAM          | 3/4         | 117             | 130   | 243            | 270   | 526.6          | 585   | 1053           | 1170   |
|                 | 7         | 64-QAM          | 5/6         | 130             | 144.4 | 270            | 300   | 585            | 650   | 1170           | 1300   |
|                 | 8         | 256-QAM         | 3/4         | 156             | 173.4 | 324            | 360   | 702            | 780   | 1404           | 1560   |
|                 | 9         | 256-QAM         | 5/6         | N/A             | N/A   | 360            | 400   | 780            | 866.6 | 1560           | 1733.4 |

**Power output at various data rates**

| Test Mode               | Bandwidth | Frequency (MHz) | Channel | Data Rate | Average Power (dBm) |
|-------------------------|-----------|-----------------|---------|-----------|---------------------|
| 802.11a (Ant 0)         | 20        | 5180            | 36      | 6         | 16.63               |
|                         |           |                 |         | 24        | 16.45               |
|                         |           |                 |         | 54        | 16.32               |
| 802.11n(20MHz) (Ant 0)  | 20        | 5180            | 36      | MCS0      | 16.64               |
|                         |           |                 |         | MCS3      | 16.43               |
|                         |           |                 |         | MCS7      | 16.30               |
| 802.11n(40MHz) (Ant 0)  | 40        | 5190            | 38      | MCS0      | 15.02               |
|                         |           |                 |         | MCS3      | 14.93               |
|                         |           |                 |         | MCS7      | 14.87               |
| 802.11ac(20MHz) (Ant 0) | 20        | 5180            | 36      | MCS0NSS1  | 16.56               |
|                         |           |                 |         | MCS5NSS1  | 16.51               |
|                         |           |                 |         | MCS9NSS1  | 16.38               |
| 802.11ac(40MHz) (Ant 0) | 40        | 5190            | 38      | MCS0NSS1  | 15.25               |
|                         |           |                 |         | MCS5NSS1  | 15.17               |
|                         |           |                 |         | MCS9NSS1  | 15.08               |
| 802.11ac(80MHz) (Ant 0) | 80        | 5210            | 42      | MCS0NSS1  | 15.86               |
|                         |           |                 |         | MCS5NSS1  | 15.68               |
|                         |           |                 |         | MCS9NSS1  | 15.59               |



| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | Average Power<br>Output(dBm) | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|------------------------------|----------------|--------|
|                 |                     |                |                | Ant 0                        |                |        |
| 802.11a         | 13                  | 36             | 5180           | 16.63                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 16.50                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 16.39                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 17.01                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 17.13                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 16.94                        | 30             | Pass   |
| 802.11n(20MHz)  | 13                  | 36             | 5180           | 16.64                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 16.44                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 16.45                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 16.53                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 16.83                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 16.49                        | 30             | Pass   |
| 802.11n(40MHz)  | 27                  | 38             | 5190           | 15.02                        | 30             | Pass   |
|                 |                     | 46             | 5230           | 15.05                        | 30             | Pass   |
|                 |                     | 151            | 5755           | 15.24                        | 30             | Pass   |
|                 |                     | 159            | 5795           | 15.05                        | 30             | Pass   |
| 802.11ac(20MHz) | 13                  | 36             | 5180           | 16.56                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 16.28                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 16.42                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 16.12                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 16.94                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 16.65                        | 30             | Pass   |
| 802.11ac(40MHz) | 27                  | 38             | 5190           | 15.25                        | 30             | Pass   |
|                 |                     | 46             | 5230           | 15.18                        | 30             | Pass   |
|                 |                     | 151            | 5755           | 15.40                        | 30             | Pass   |
|                 |                     | 159            | 5795           | 15.31                        | 30             | Pass   |
| 802.11ac(80MHz) | 58.6                | 42             | 5210           | 15.86                        | 30             | Pass   |
|                 |                     | 155            | 5775           | 16.41                        | 30             | Pass   |



| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | Average Power<br>Output(dBm) | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|------------------------------|----------------|--------|
|                 |                     |                |                | Ant 1                        |                |        |
| 802.11a         | 13                  | 36             | 5180           | 17.15                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 17.08                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 17.03                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 17.14                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 17.24                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 17.14                        | 30             | Pass   |
| 802.11n(20MHz)  | 13                  | 36             | 5180           | 17.10                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 16.93                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 16.98                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 16.34                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 17.28                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 17.03                        | 30             | Pass   |
| 802.11n(40MHz)  | 27                  | 38             | 5190           | 15.78                        | 30             | Pass   |
|                 |                     | 46             | 5230           | 15.67                        | 30             | Pass   |
|                 |                     | 151            | 5755           | 15.77                        | 30             | Pass   |
|                 |                     | 159            | 5795           | 15.59                        | 30             | Pass   |
| 802.11ac(20MHz) | 13                  | 36             | 5180           | 17.44                        | 30             | Pass   |
|                 |                     | 40             | 5200           | 17.16                        | 30             | Pass   |
|                 |                     | 48             | 5240           | 17.26                        | 30             | Pass   |
|                 |                     | 149            | 5745           | 17.35                        | 30             | Pass   |
|                 |                     | 157            | 5785           | 17.30                        | 30             | Pass   |
|                 |                     | 165            | 5825           | 17.14                        | 30             | Pass   |
| 802.11ac(40MHz) | 27                  | 38             | 5190           | 15.96                        | 30             | Pass   |
|                 |                     | 46             | 5230           | 16.00                        | 30             | Pass   |
|                 |                     | 151            | 5755           | 15.91                        | 30             | Pass   |
|                 |                     | 159            | 5795           | 15.85                        | 30             | Pass   |
| 802.11ac(80MHz) | 58.6                | 42             | 5210           | 16.62                        | 30             | Pass   |
|                 |                     | 155            | 5775           | 16.76                        | 30             | Pass   |



| Test Mode       | Data Rate (Mbps) | Channel No. | Freq. (MHz) | Average Power Output(dBm) |       | Total Power Output(dBm) | Limit (dBm) | Result |
|-----------------|------------------|-------------|-------------|---------------------------|-------|-------------------------|-------------|--------|
|                 |                  |             |             | Ant (0+1)                 |       |                         |             |        |
|                 |                  |             |             | Ant 0                     | Ant 1 |                         |             |        |
| 802.11n(20MHz)  | 13               | 36          | 5180        | 16.25                     | 16.85 | 19.57                   | 28.99       | Pass   |
|                 |                  | 40          | 5200        | 15.99                     | 16.77 | 19.41                   | 28.99       | Pass   |
|                 |                  | 48          | 5240        | 16.07                     | 16.57 | 19.34                   | 28.99       | Pass   |
|                 |                  | 149         | 5745        | 15.24                     | 15.31 | 18.29                   | 28.99       | Pass   |
|                 |                  | 157         | 5785        | 16.66                     | 16.71 | 19.70                   | 28.99       | Pass   |
|                 |                  | 165         | 5825        | 16.46                     | 16.72 | 19.60                   | 28.99       | Pass   |
| 802.11n(40MHz)  | 27               | 38          | 5190        | 14.94                     | 15.68 | 18.34                   | 28.99       | Pass   |
|                 |                  | 46          | 5230        | 14.71                     | 15.64 | 18.21                   | 28.99       | Pass   |
|                 |                  | 151         | 5755        | 14.96                     | 15.16 | 18.07                   | 28.99       | Pass   |
|                 |                  | 159         | 5795        | 14.82                     | 15.01 | 17.93                   | 28.99       | Pass   |
| 802.11ac(20MHz) | 13               | 36          | 5180        | 16.27                     | 16.8  | 19.55                   | 28.99       | Pass   |
|                 |                  | 40          | 5200        | 15.98                     | 16.78 | 19.41                   | 28.99       | Pass   |
|                 |                  | 48          | 5240        | 16.16                     | 16.79 | 19.50                   | 28.99       | Pass   |
|                 |                  | 149         | 5745        | 16.56                     | 16.75 | 19.67                   | 28.99       | Pass   |
|                 |                  | 157         | 5785        | 16.55                     | 16.8  | 19.69                   | 28.99       | Pass   |
|                 |                  | 165         | 5825        | 16.54                     | 16.57 | 19.57                   | 28.99       | Pass   |
| 802.11ac(40MHz) | 27               | 38          | 5190        | 15.07                     | 15.69 | 18.40                   | 28.99       | Pass   |
|                 |                  | 46          | 5230        | 15.14                     | 15.6  | 18.39                   | 28.99       | Pass   |
|                 |                  | 151         | 5755        | 15.44                     | 15.62 | 18.54                   | 28.99       | Pass   |
|                 |                  | 159         | 5795        | 15.36                     | 15.58 | 18.48                   | 28.99       | Pass   |
| 802.11ac(80MHz) | 58.6             | 42          | 5210        | 15.71                     | 16.11 | 18.92                   | 28.99       | Pass   |
|                 |                  | 155         | 5775        | 15.7                      | 15.83 | 18.78                   | 28.99       | Pass   |



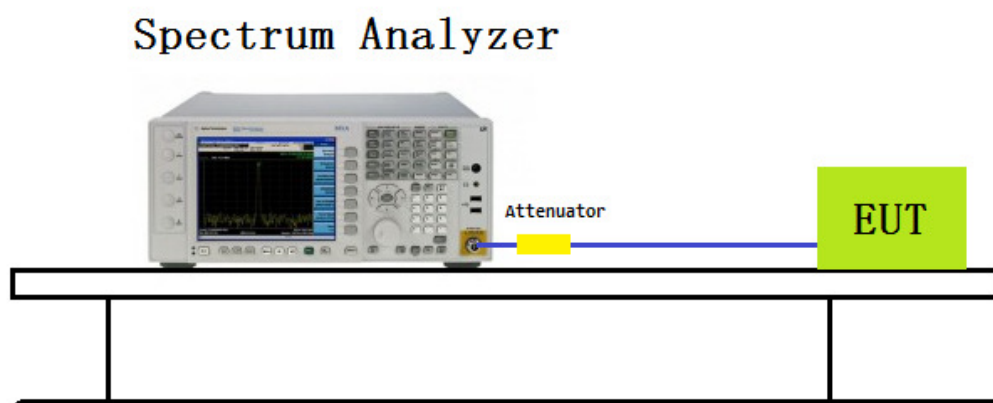
## 9. Power Spectral Density

### 9.1 Test Equipment

| Instrument                  | Manufacturer | Type No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|----------|------------|------------------|-------------|
| Spectrum Analyzer           | Agilent      | N9010A   | MY53400169 | 2014.11.03       | 2015.11.03  |
| Temperature/ Humidity Meter | Zhicheng     | ZC1-11   | CEP-TH-003 | 2015.03.31       | 2016.03.30  |

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

### 9.2 Test Setup





### 9.3 Limit

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

**5.15-5.25 GHz: Limit (dBm) = 17dBm-(7.01dBi-6dBi)=15.99dBm**

**5.725-5.85 GHz Limit (dBm/500kHz) = 30dBm/500kHz-(7.01dBi-6dBi)=28.99 dBm**

### 9.4 Test Procedure

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points  $\geq 2 \times (\text{span} / \text{RBW})$
6. Detector = power averaging (RMS)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add  $10 \cdot \log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add  $10 \cdot \log(1/0.25) = 6 \text{ dB}$  if the duty cycle is 25 percent.
11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor  $10 \cdot \log(500\text{kHz}/100\text{kHz}) = 7 \text{ dB}$  to the measured result.



## 9.5 Test Result

| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | PSD(dBm) | Duty<br>Cycle(%) | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|----------|------------------|----------------|--------|
|                 |                     |                |                | Ant 0    |                  |                |        |
| 802.11a         | 13                  | 36             | 5180           | 6.023    | 93               | 17             | Pass   |
|                 |                     | 40             | 5200           | 5.205    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.359    |                  | 17             | Pass   |
| 802.11n(20MHz)  | 13                  | 36             | 5180           | 5.387    | 94               | 17             | Pass   |
|                 |                     | 40             | 5200           | 4.899    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.333    |                  | 17             | Pass   |
| 802.11n(40MHz)  | 27                  | 38             | 5190           | 1.007    | 87               | 17             | Pass   |
|                 |                     | 46             | 5230           | 1.106    |                  | 17             | Pass   |
| 802.11ac(20MHz) | 13                  | 36             | 5180           | 5.54     | 99               | 17             | Pass   |
|                 |                     | 40             | 5200           | 5.502    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.699    |                  | 17             | Pass   |
| 802.11ac(40MHz) | 27                  | 38             | 5190           | 1.222    | 93               | 17             | Pass   |
|                 |                     | 46             | 5230           | 1.247    |                  | 17             | Pass   |
| 802.11ac(80MHz) | 58.6                | 42             | 5210           | -1.362   | 87               | 17             | Pass   |

| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | PSD(dBm) | Duty<br>Cycle(%) | Constant<br>Factor | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|----------|------------------|--------------------|----------------|--------|
|                 |                     |                |                | Ant 0    |                  |                    |                |        |
| 802.11a         | 13                  | 149            | 5745           | -2.178   | 93               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -1.991   |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -3.208   |                  | 7                  | 30             | Pass   |
| 802.11n(20MHz)  | 13                  | 149            | 5745           | -2.976   | 94               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -2.628   |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -3.210   |                  | 7                  | 30             | Pass   |
| 802.11n(40MHz)  | 27                  | 149            | 5745           | -7.618   | 87               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -7.721   |                  | 7                  | 30             | Pass   |
| 802.11ac(20MHz) | 13                  | 149            | 5745           | -3.85    | 99               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -2.98    |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -2.788   |                  | 7                  | 30             | Pass   |
| 802.11ac(40MHz) | 27                  | 149            | 5745           | -7.033   | 93               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -7.228   |                  | 7                  | 30             | Pass   |
| 802.11ac(80MHz) | 58.6                | 155            | 5775           | -9.972   | 87               | 7                  | 30             | Pass   |



| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | PSD(dBm) | Duty<br>Cycle(%) | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|----------|------------------|----------------|--------|
|                 |                     |                |                | Ant 1    |                  |                |        |
| 802.11a         | 13                  | 36             | 5180           | 5.193    | 93               | 17             | Pass   |
|                 |                     | 40             | 5200           | 5.447    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.484    |                  | 17             | Pass   |
| 802.11n(20MHz)  | 13                  | 36             | 5180           | 5.336    | 94               | 17             | Pass   |
|                 |                     | 40             | 5200           | 4.817    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.468    |                  | 17             | Pass   |
| 802.11n(40MHz)  | 27                  | 38             | 5190           | 0.952    | 87               | 17             | Pass   |
|                 |                     | 46             | 5230           | 0.862    |                  | 17             | Pass   |
| 802.11ac(20MHz) | 13                  | 36             | 5180           | 5.39     | 99               | 17             | Pass   |
|                 |                     | 40             | 5200           | 5.179    |                  | 17             | Pass   |
|                 |                     | 48             | 5240           | 5.593    |                  | 17             | Pass   |
| 802.11ac(40MHz) | 27                  | 38             | 5190           | 0.789    | 93               | 17             | Pass   |
|                 |                     | 46             | 5230           | 0.961    |                  | 17             | Pass   |
| 802.11ac(80MHz) | 58.6                | 42             | 5210           | -1.532   | 87               | 17             | Pass   |

| Test Mode       | Data Rate<br>(Mbps) | Channel<br>No. | Freq.<br>(MHz) | PSD(dBm) | Duty<br>Cycle(%) | Constant<br>Factor | Limit<br>(dBm) | Result |
|-----------------|---------------------|----------------|----------------|----------|------------------|--------------------|----------------|--------|
|                 |                     |                |                | Ant 1    |                  |                    |                |        |
| 802.11a         | 13                  | 149            | 5745           | -2.838   | 93               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -2.186   |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -3.030   |                  | 7                  | 30             | Pass   |
| 802.11n(20MHz)  | 13                  | 149            | 5745           | -3.466   | 94               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -2.686   |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -2.864   |                  | 7                  | 30             | Pass   |
| 802.11n(40MHz)  | 27                  | 149            | 5745           | -7.748   | 87               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -7.312   |                  | 7                  | 30             | Pass   |
| 802.11ac(20MHz) | 13                  | 149            | 5745           | -3.572   | 99               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -3.313   |                  | 7                  | 30             | Pass   |
|                 |                     | 165            | 5825           | -3.526   |                  | 7                  | 30             | Pass   |
| 802.11ac(40MHz) | 27                  | 149            | 5745           | -7.747   | 93               | 7                  | 30             | Pass   |
|                 |                     | 157            | 5785           | -7.558   |                  | 7                  | 30             | Pass   |
| 802.11ac(80MHz) | 58.6                | 155            | 5775           | -10.316  | 87               | 7                  | 30             | Pass   |



| Test Mode       | Data Rate (Mbps) | Channel No. | Freq. (MHz) | PSD(dBm) |       | Duty Cycle(%) | Total PSD(dBm) | Limit (dBm) | Result |
|-----------------|------------------|-------------|-------------|----------|-------|---------------|----------------|-------------|--------|
|                 |                  |             |             | Ant 0+1  |       |               |                |             |        |
|                 |                  |             |             | Ant 0    | Ant 1 |               |                |             |        |
| 802.11n(20 MHz) | 13               | 36          | 5180        | 5.89     | 5.53  | 94            | 8.99           | 15.99       | Pass   |
|                 |                  | 40          | 5200        | 5.97     | 5.50  |               | 9.02           | 15.99       | Pass   |
|                 |                  | 48          | 5240        | 6.28     | 5.72  |               | 9.29           | 15.99       | Pass   |
| 802.11n(40 MHz) | 27               | 38          | 5190        | 1.83     | 1.04  | 87            | 5.06           | 15.99       | Pass   |
|                 |                  | 46          | 5230        | 1.67     | 1.29  |               | 5.09           | 15.99       | Pass   |
| 802.11ac(20MHz) | 13               | 36          | 5180        | 6.01     | 5.83  | 99            | 8.93           | 15.99       | Pass   |
|                 |                  | 40          | 5200        | 5.68     | 5.35  |               | 8.53           | 15.99       | Pass   |
|                 |                  | 48          | 5240        | 5.84     | 5.51  |               | 8.69           | 15.99       | Pass   |
| 802.11ac(40MHz) | 27               | 38          | 5190        | 1.22     | 1.20  | 93            | 4.54           | 15.99       | Pass   |
|                 |                  | 46          | 5230        | 1.43     | 1.26  |               | 4.68           | 15.99       | Pass   |
| 802.11ac(80MHz) | 58.6             | 42          | 5210        | -1.79    | -1.55 | 87            | 1.94           | 15.99       | Pass   |

| Test Mode       | Data Rate (Mbps) | Channel No. | Freq. (MHz) | PSD(dBm) |        | Duty Cycle(%) | Constant Factor | Total PSD (dBm) | Limit (dBm) | Result |
|-----------------|------------------|-------------|-------------|----------|--------|---------------|-----------------|-----------------|-------------|--------|
|                 |                  |             |             | Ant 0+1  |        |               |                 |                 |             |        |
|                 |                  |             |             | Ant 0    | Ant 1  |               |                 |                 |             |        |
| 802.11n(20MHz)  | 13               | 149         | 5745        | -3.54    | -4.30  | 94            | 7               | 6.38            | 28.99       | Pass   |
|                 |                  | 157         | 5785        | -2.24    | -2.39  |               | 7               | 7.97            | 28.99       | Pass   |
|                 |                  | 165         | 5825        | -2.39    | -3.21  |               | 7               | 7.50            | 28.99       | Pass   |
| 802.11n(40MHz)  | 27               | 149         | 5745        | -7.00    | -7.63  | 87            | 7               | 3.31            | 28.99       | Pass   |
|                 |                  | 157         | 5785        | -6.88    | -7.13  |               | 7               | 3.61            | 28.99       | Pass   |
| 802.11ac(20MHz) | 13               | 149         | 5745        | -2.12    | -2.84  | 99            | 7               | 7.55            | 28.99       | Pass   |
|                 |                  | 157         | 5785        | -1.90    | -2.84  |               | 7               | 7.67            | 28.99       | Pass   |
|                 |                  | 165         | 5825        | -2.26    | -2.84  |               | 7               | 7.79            | 28.99       | Pass   |
| 802.11ac(40MHz) | 27               | 149         | 5745        | -7.05    | -7.33  | 93            | 7               | 3.14            | 28.99       | Pass   |
|                 |                  | 157         | 5785        | -6.82    | -7.34  |               | 7               | 3.54            | 28.99       | Pass   |
| 802.11ac(80MHz) | 58.6             | 155         | 5775        | -10.00   | -10.12 | 87            | 7               | 0.55            | 28.99       | Pass   |

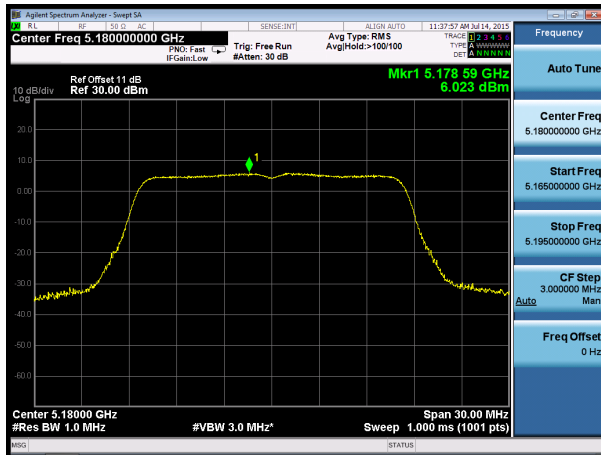
Note:

1. When EUT duty cycle < 98%, the total PSD =  $10 \cdot \log\{10(\text{Ant 0 PSD}/10) + 10(\text{Ant 1 PSD}/10)\} + 10 \cdot \log(1/\text{duty cycle}) + \text{Constant Factor}$ .
2. PSD unite: dBm/500KHz

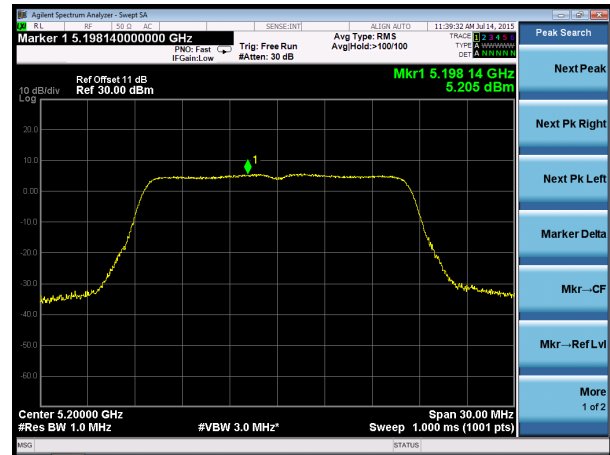


## 802.11a Power Spectral Density- Ant 0

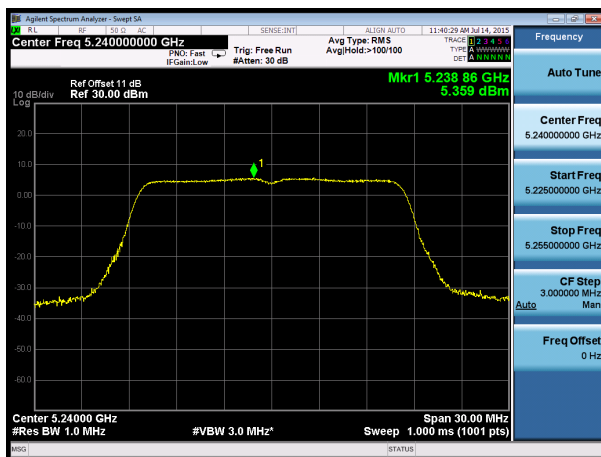
Channel 36 (5180MHz)



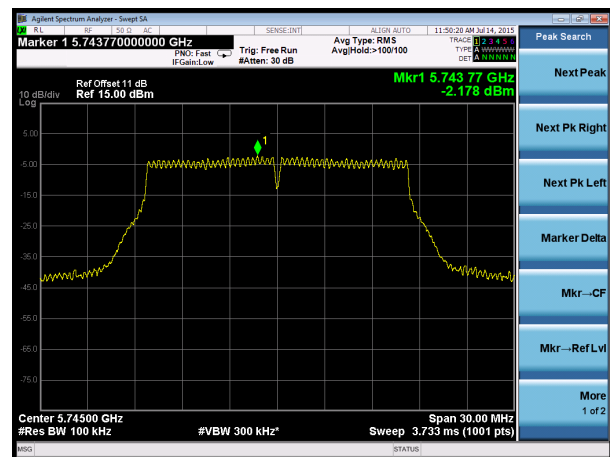
Channel 40 (5200MHz)



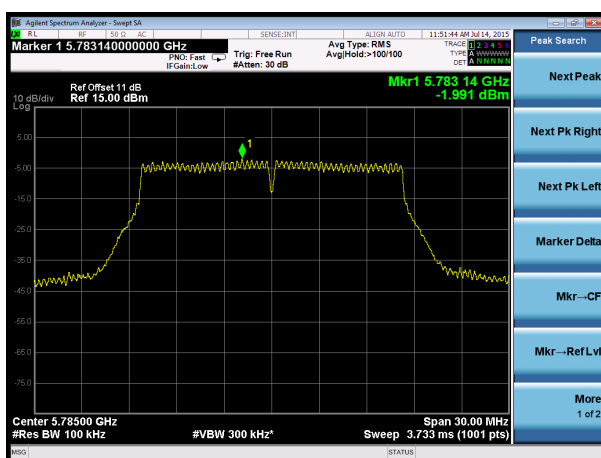
Channel 48 (5240MHz)



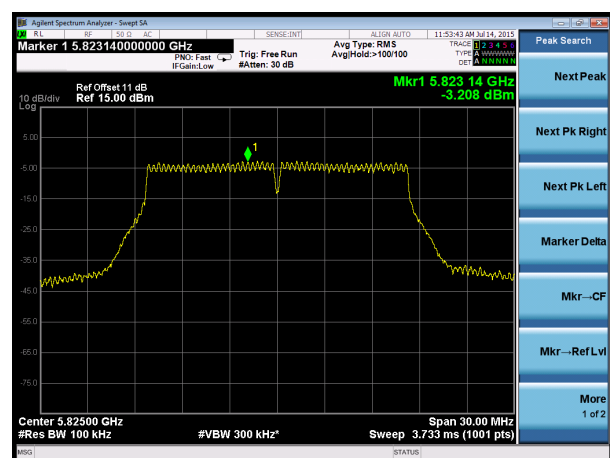
Channel 149 (5745MHz)



Channel 157 (5785MHz)



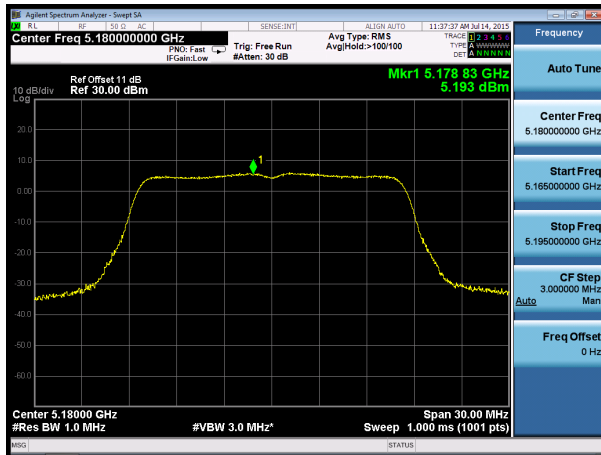
Channel 165 (5825MHz)



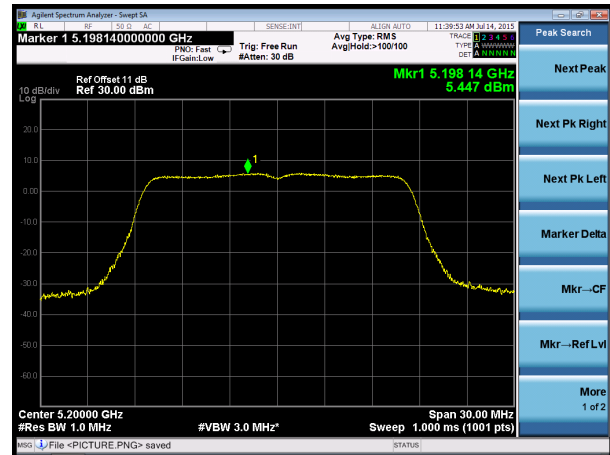


## 802.11a Power Spectral Density- Ant 1

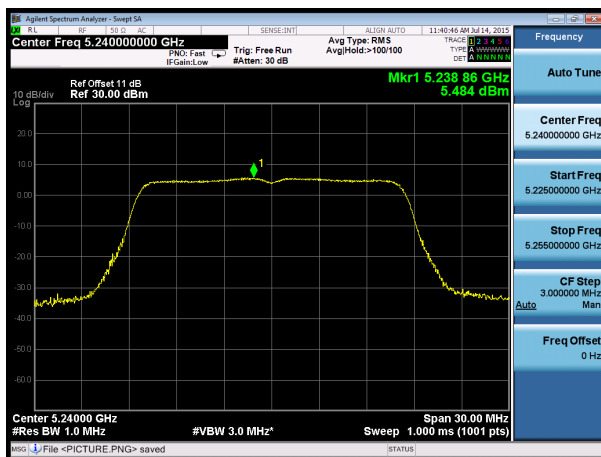
Channel 36 (5180MHz)



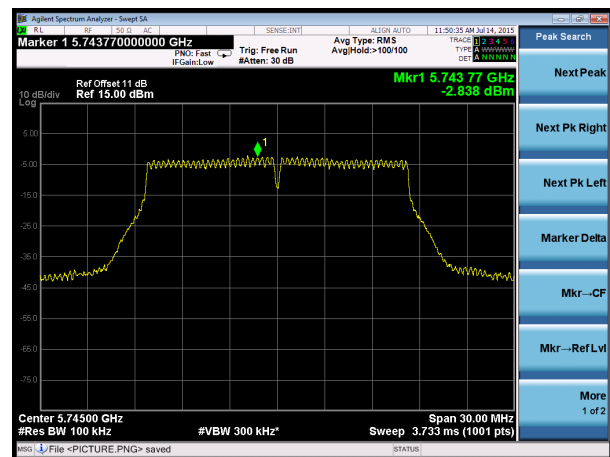
Channel 40 (5200MHz)



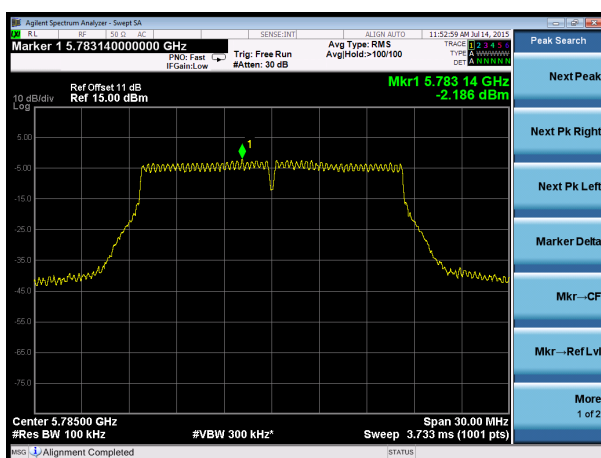
Channel 48 (5240MHz)



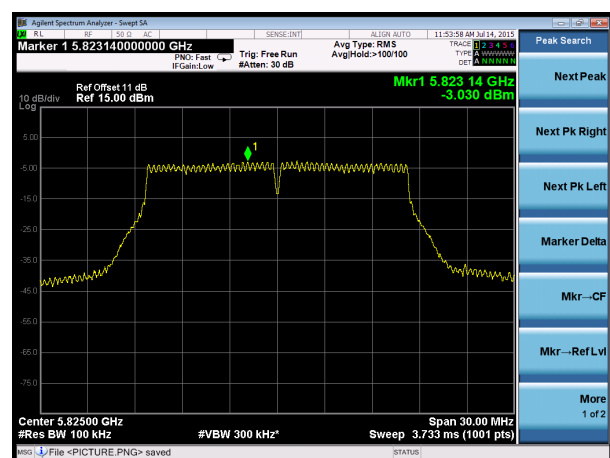
Channel 149 (5745MHz)



Channel 157 (5785MHz)



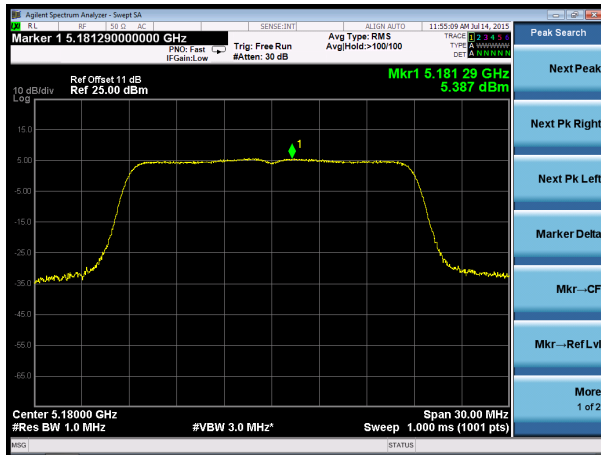
Channel 165 (5825MHz)



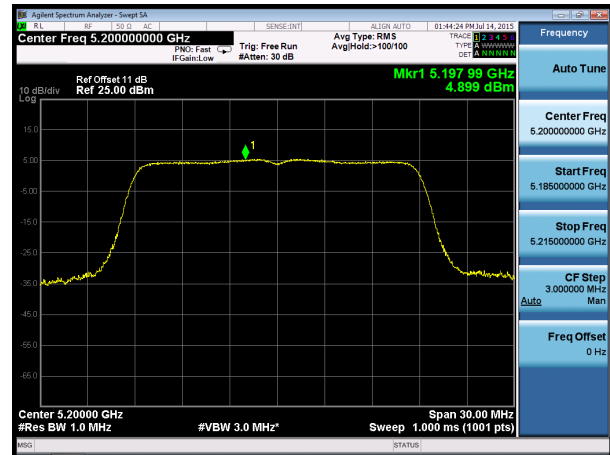


## 802.11n20 Power Spectral Density- Ant 0

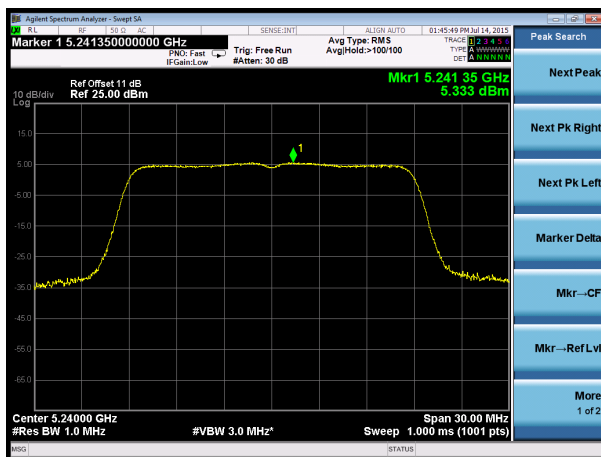
Channel 36 (5180MHz)



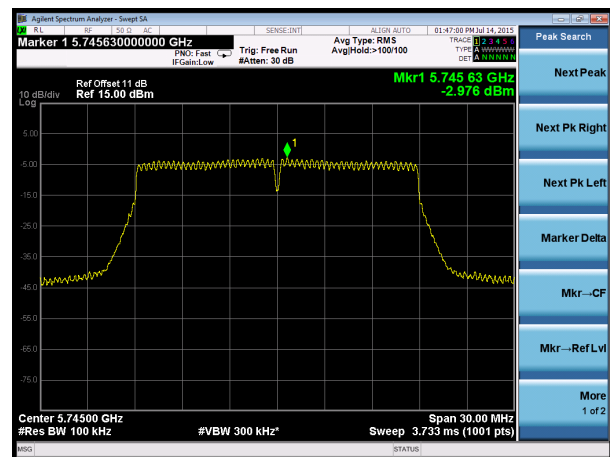
Channel 40 (5200MHz)



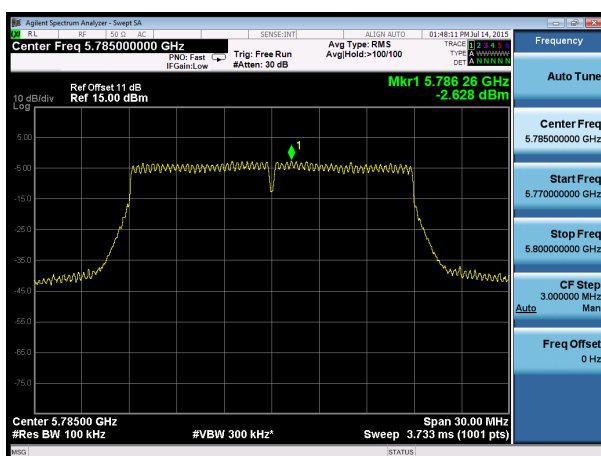
Channel 48 (5240MHz)



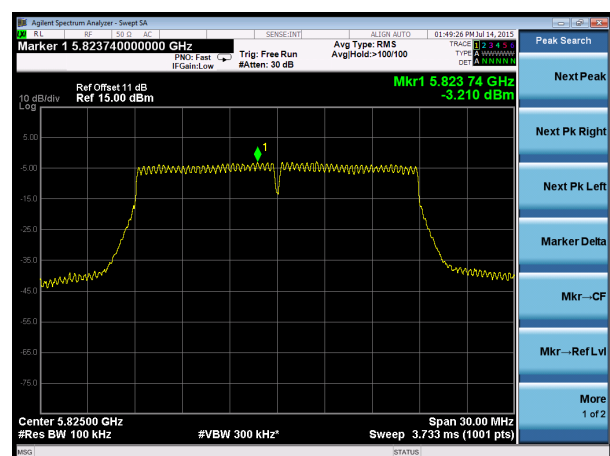
Channel 149 (5745MHz)



Channel 157 (5785MHz)



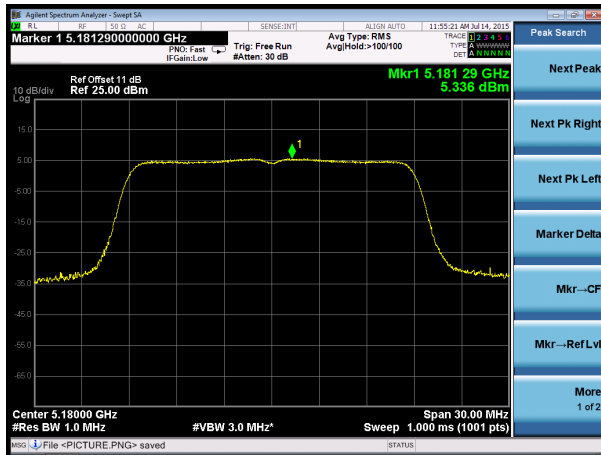
Channel 165 (5825MHz)



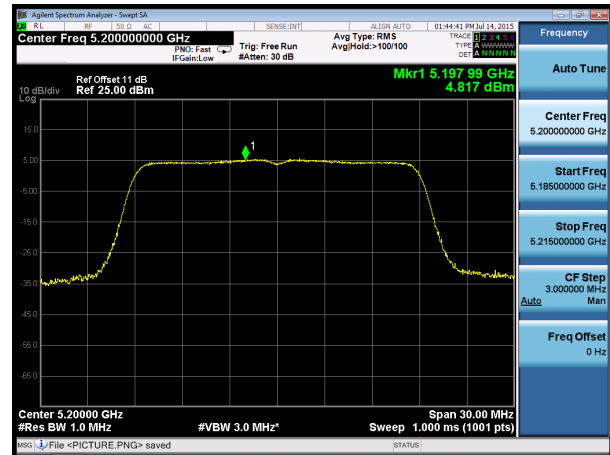


## 802.11n20 Power Spectral Density- Ant 1

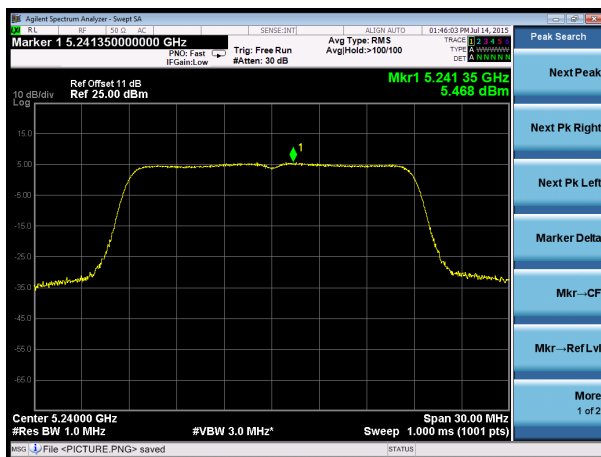
Channel 36 (5180MHz)



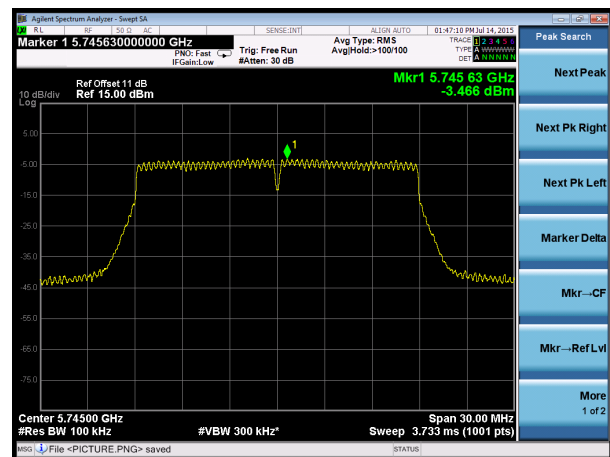
Channel 40 (5200MHz)



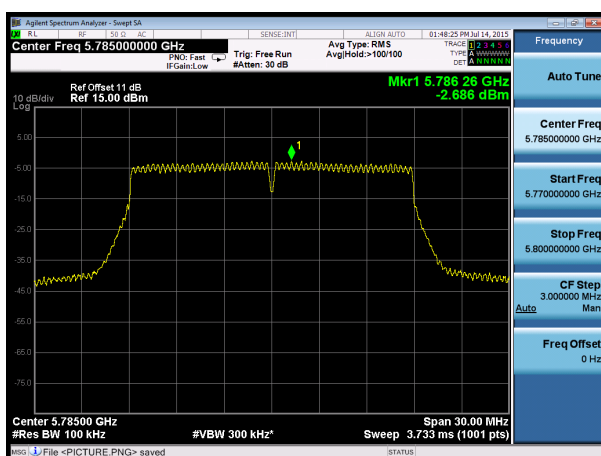
Channel 48 (5240MHz)



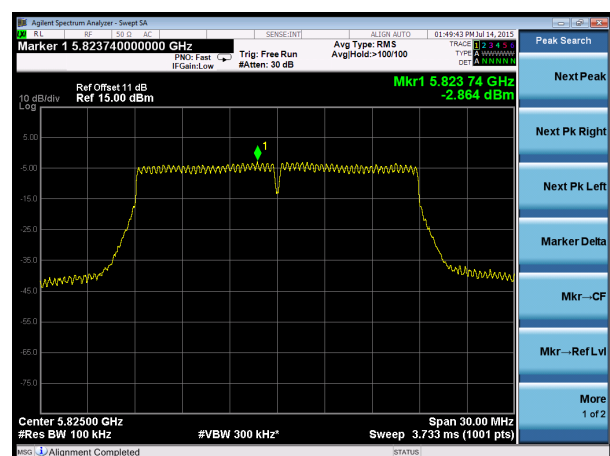
Channel 149 (5745MHz)



Channel 157 (5785MHz)



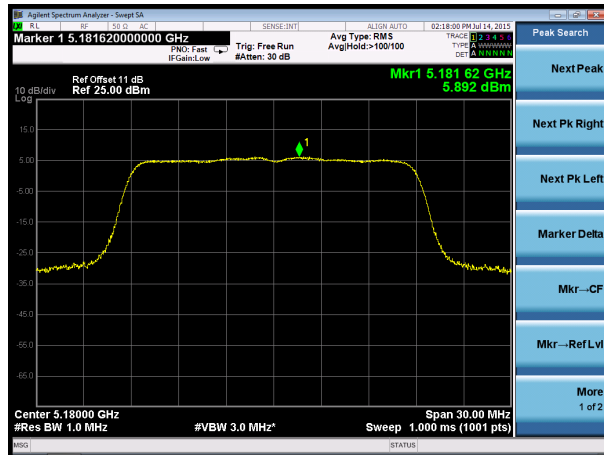
Channel 165 (5825MHz)





## 802.11n20 Power Spectral Density- Ant 0+1-0

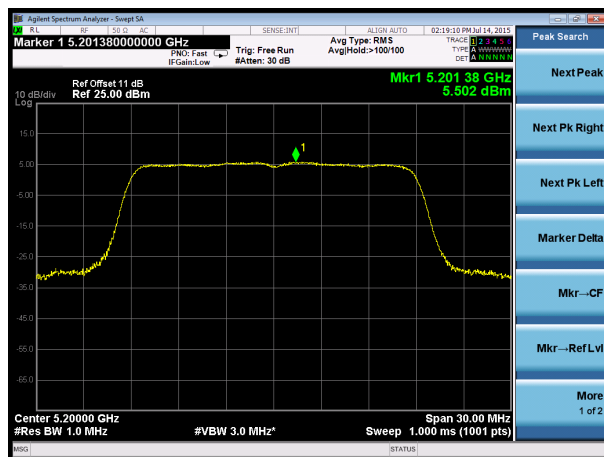
Channel 36 (5180MHz)



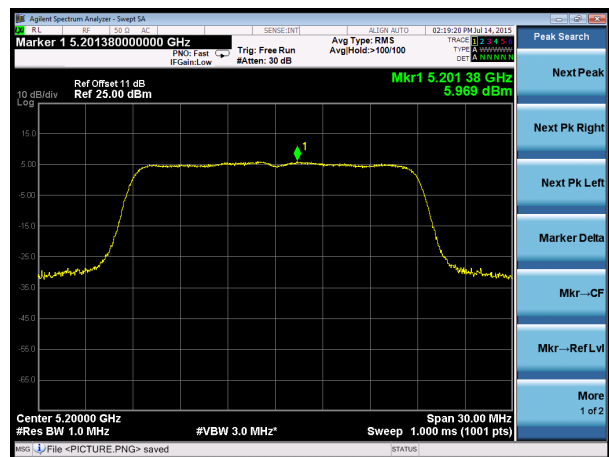
Channel 40 (5200MHz)



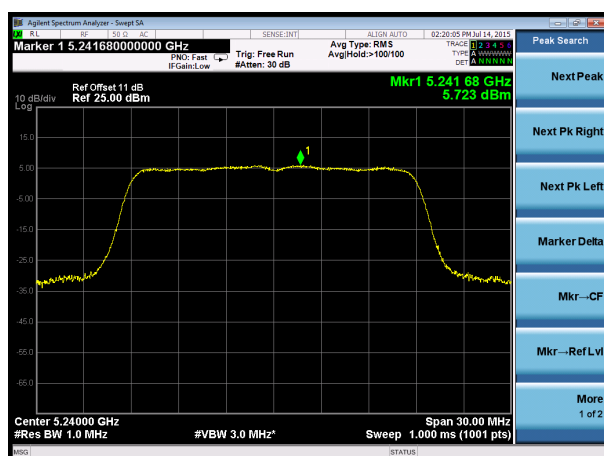
Channel 48 (5240MHz)



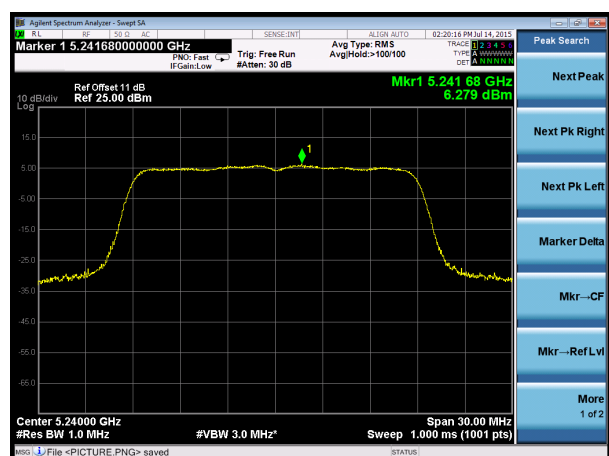
Channel 149 (5745MHz)



Channel 157 (5785MHz)



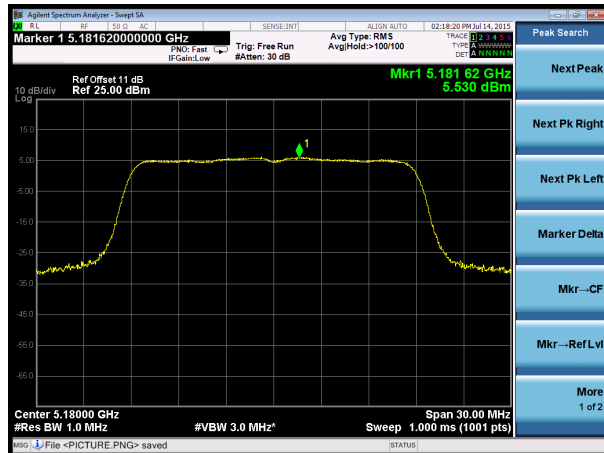
Channel 165 (5825MHz)



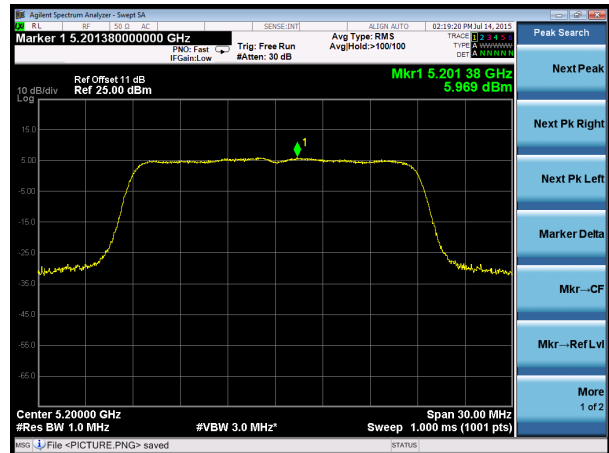


## 802.11n20 Power Spectral Density- Ant 0+1-1

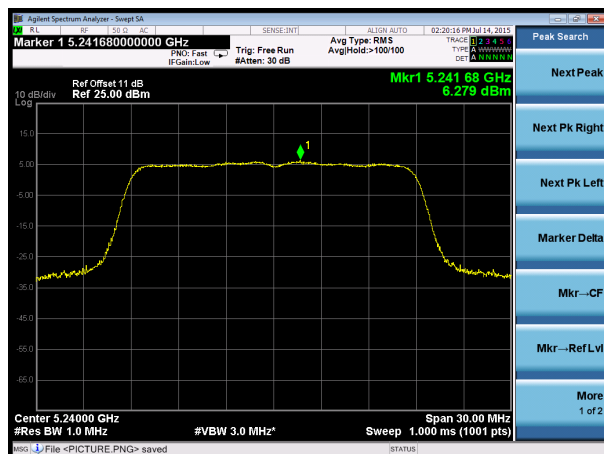
Channel 36 (5180MHz)



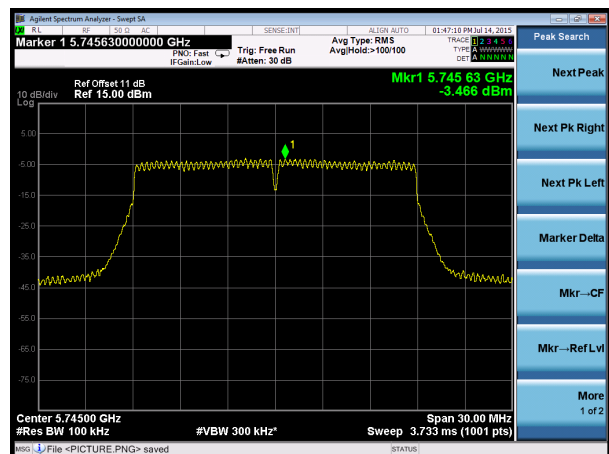
Channel 40 (5200MHz)



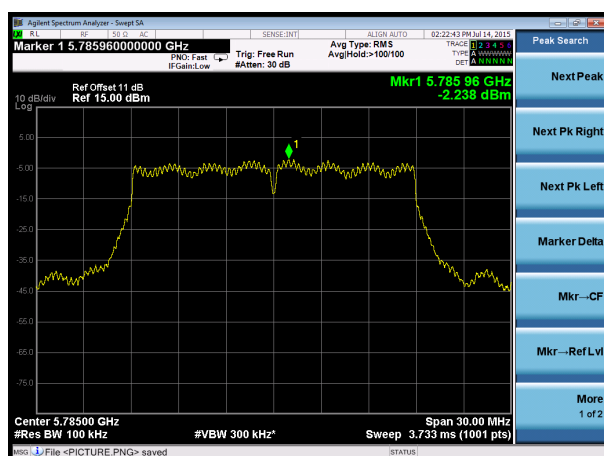
Channel 48 (5240MHz)



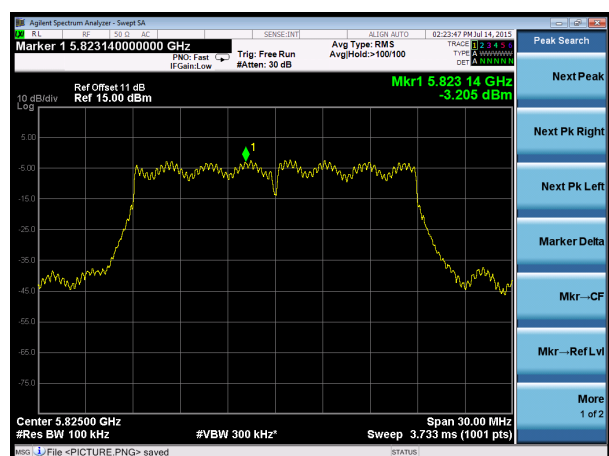
Channel 149 (5745MHz)



Channel 157 (5785MHz)



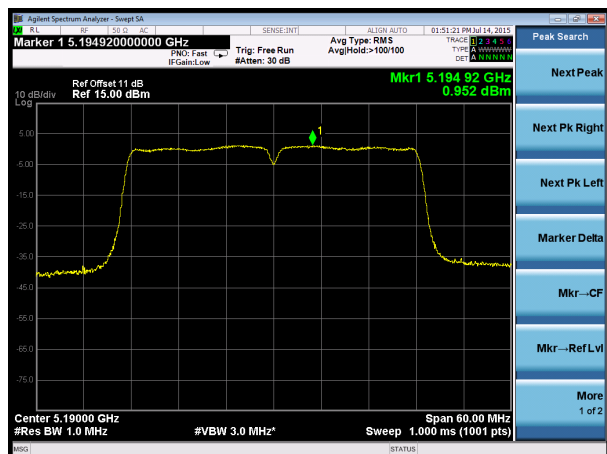
Channel 165 (5825MHz)



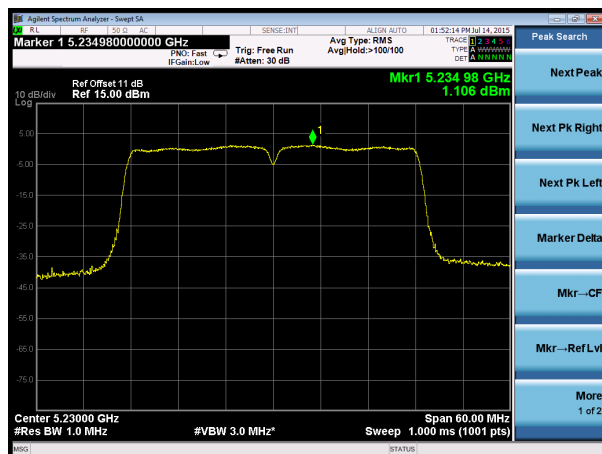


## 802.11n(40MHz) Power Spectral Density- Ant 0

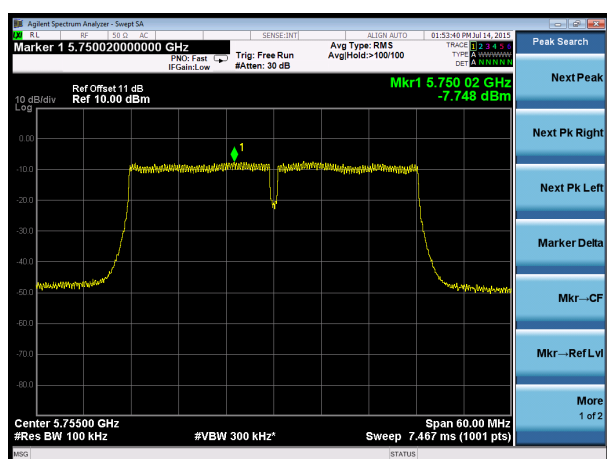
Channel 38 (5190MHz)



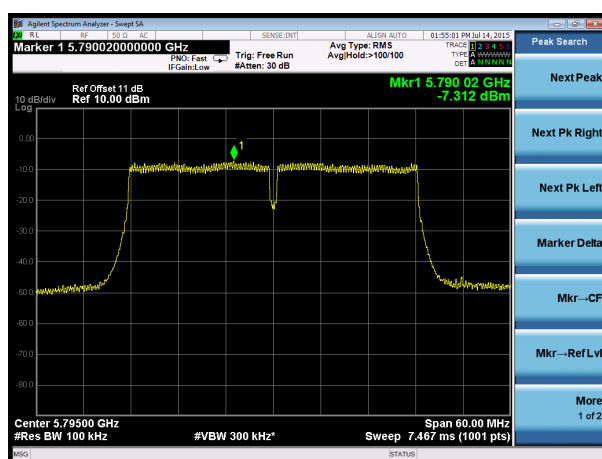
Channel 46 (5230MHz)



Channel 155 (5755MHz)



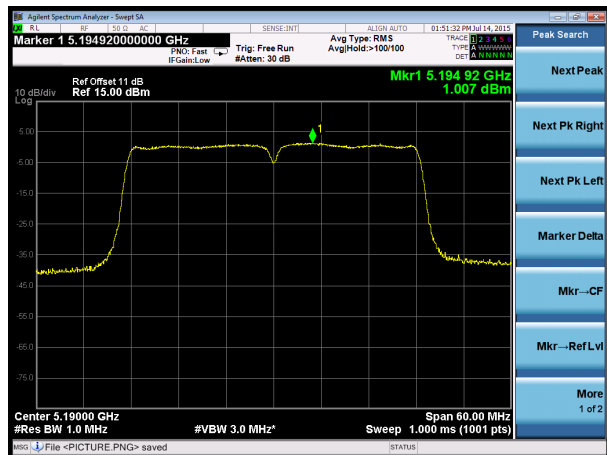
Channel 159 (5795MHz)



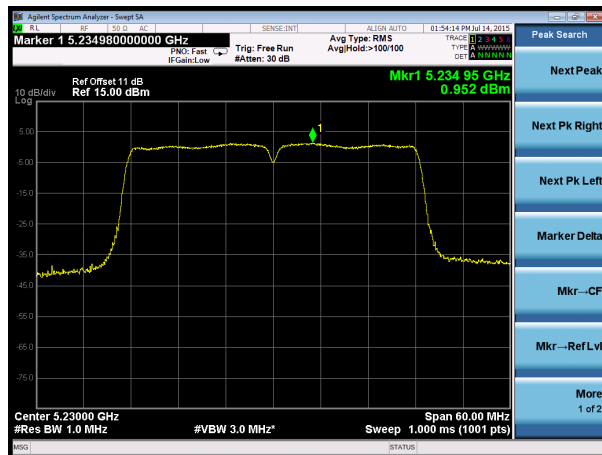


## 802.11n(40MHz) Power Spectral Density- Ant 1

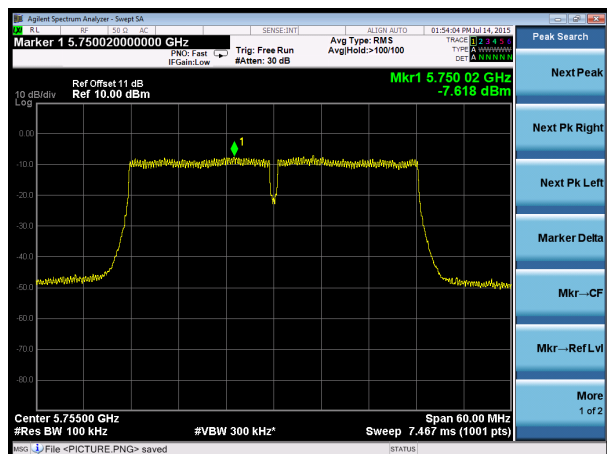
Channel 38 (5190MHz)



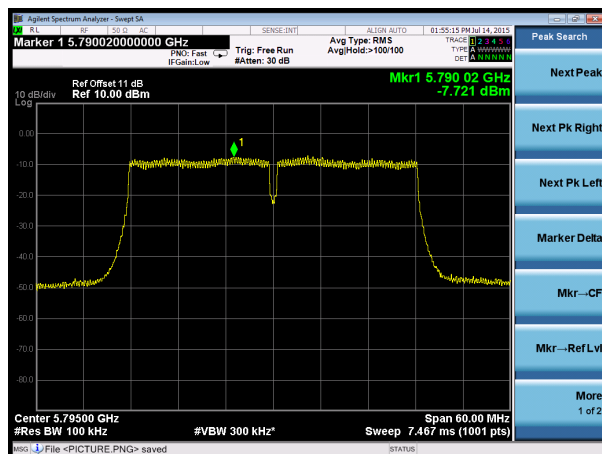
Channel 46 (5230MHz)



Channel 155 (5755MHz)



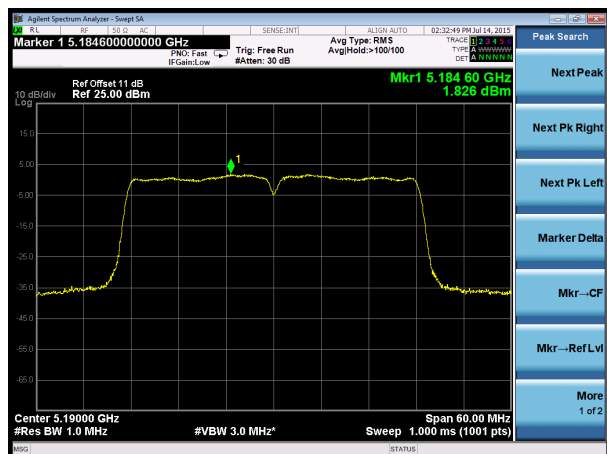
Channel 159 (5795MHz)



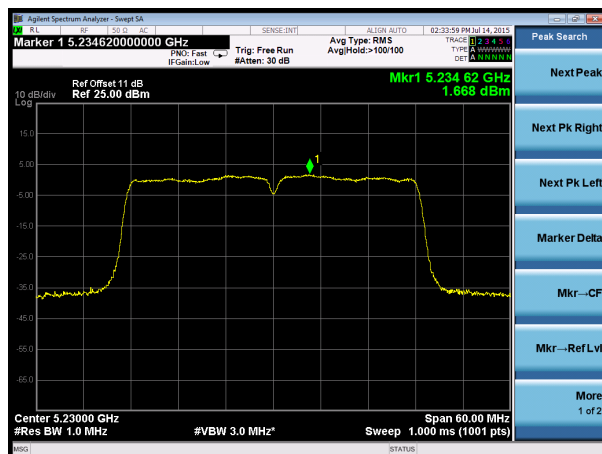


## 802.11n(40MHz) Power Spectral Density- Ant 0+1-0

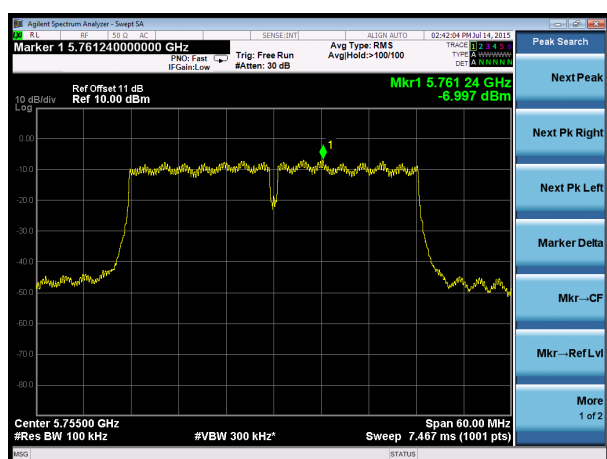
Channel 38 (5190MHz)



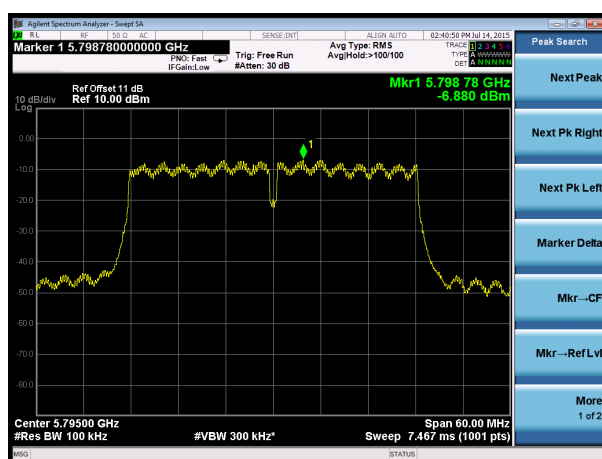
Channel 46 (5230MHz)



Channel 155 (5755MHz)



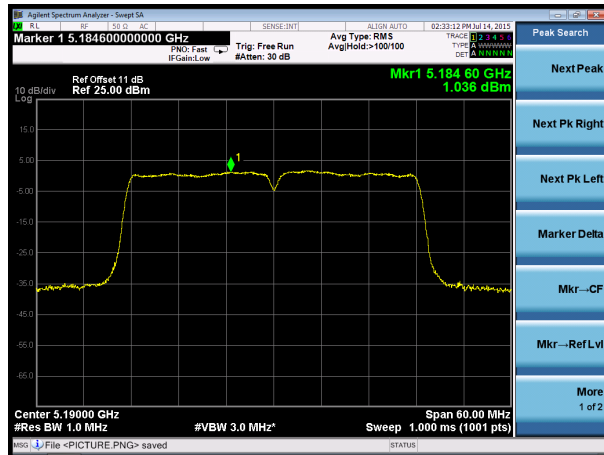
Channel 159 (5795MHz)



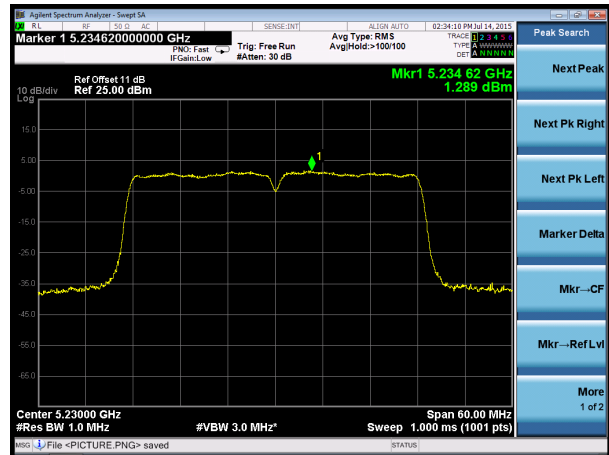


## 802.11n(40MHz) Power Spectral Density- Ant 0+1-1

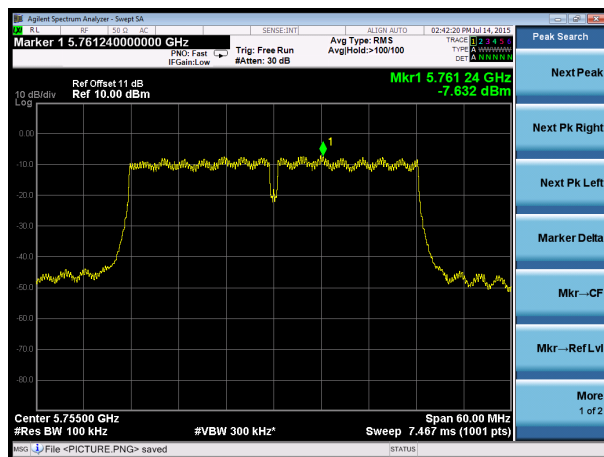
Channel 38 (5190MHz)



Channel 46 (5230MHz)



Channel 155 (5755MHz)



Channel 159 (5795MHz)

